USE OF HYDROXYAROMATIC COMPOUNDS AS SAFENERS

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PATENT APPLICATION

-with-

Priority of

DE 103 13 480.8 of March 26, 2003

BCS 03-1005 .... (9879*43)

BAYER CROPSCIENCE GMBH BCS 03-1005 Dr. WE

Use of hydroxyaromatic compounds as safeners

Description

The present invention relates to the field of safeners or resistance inductors for protecting crop plants or useful plants against damage caused by the use of agrochemicals such as xenobiocides or biocides, for example herbicides, insecticides, acaricides, nematicides or fungicides, infection by pathogens such as fungi, bacteria, viruses or else by harmful environmental factors such as aridity or drought. Specifically, the invention relates to the novel use of certain hydroxy-aromatic compounds as safeners, and to novel compounds from this group.

When controlling unwanted organisms in crops of plants which are useful for agriculture or forestry by using pesticides, the useful plants are frequently also damaged to a greater or lesser extent, in a manner which is unwanted per se, by the pesticides employed. This effect is encountered in particular with the use of a considerable number of herbicides in monocotyledonous and dicotyledonous crops of useful plants - and there primarily in the post-emergence application. In some instances, the useful plants can be protected against the phytotoxic properties of the pesticides by employing safeners or antidotes, without diminishing the pesticidal activity against the harmful organisms.

The action of the compounds which have hitherto been disclosed as safeners is frequently limited to certain crops and certain classes of pesticides. In particular, hardly any commercial safeners for dicotyledonous crops have become known. Likewise, for a number of pesticides, non-selective herbicides or total herbicides, hardly any safeners have been described.

US-A-4,808,208 describes the use of phenols such as mono- or dihydroxyaceto-phenone or hydroxycinnamic acids and some derivatives of these carboxylic acids as safeners for soybean crops against phytotoxic actions of the herbicide glyphosate (phosphonomethylglycine and its salts).

Moreover, DE-A-19933897 discloses that the resistance of crop plants against chemical stress caused by the use of insufficiently selective agrochemicals can be improved by using resistance inductors from the group of the acylcyclohexanediones, such as prohexadione (salts) and trinexpac-ethyl or trinexpac salts, or benzothiadiazoles or benzothiazoles or derivatives thereof, such as acibenzolar-S-methyl and probenazole.

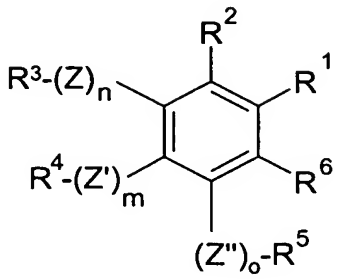
Furthermore, it is known that growth-regulator herbicides such as dicamba (2,5-dichloro-6-methoxybenzoic acid) and phenoxyalkanecarboxylic acid derivatives (2,4-D, MCPA) have been used in some cases as crop-plant-protecting compounds for coherbicides (see, for example, US-A-5,846,902, US-A-5,739,080, EP-A-512737).

US-A-4,321,084 describes herbicidal compositions comprising herbicidal thiocarbamates such as vernolate or butylate in combination with an antidote (= safener) from the group of specifically halogenated phenols. These phenols comprise known herbicides, such as the hydroxybenzonitriles bromoxynil and ioxynil, and also analogues in which the nitrile group is replaced by a carboxyl, carbalkoxy or alkyl group.

WO-A-92/11761 describes herbicide/biocide/antidote combinations where the biocide may be an insecticide, a fungicide or a nematicide and the antidotes are selected from the group of amides of different structures, which generally also includes aromatic amides, which combinations are used to avoid "negative synergism" in the interaction of herbicide and biocide.

It has now been found that, surprisingly, compounds of the formula (I) shown below or salts thereof from the group comprising certain meta- or para-hydroxybenzoic acids and derivatives thereof can be used effectively as safeners or resistance inductors for crop plants or useful plants, preferably as safeners against damage by agrochemicals such as, preferably, herbicides, in these plants.

Accordingly, the invention provides the use of compounds of the formula (I) or salts thereof,



(I)

where

R^1 is carboxyl or a derivative of the carboxyl group, preferably a radical of the formula

-CN or

-C(=X)-Y-R or

-C(=X)-Het,

where

X is a divalent radical of the formula O, S or NR^a or N-NR^aR^b, where R^a and R^b are as defined below,

Y is a group of the formula O, S, NR^c or NR^c-NR^dR^e, where R^c, R^d and R^e are as defined below,

R is hydrogen or an unsubstituted or substituted hydrocarbon radical or an unsubstituted or substituted heterocyclic radical or acyl, and

Het is an aliphatic N-heterocycle having a total of 1 to 4 heterocyclic ring atoms which is attached via a heterocyclic N-ring atom to the group C(=X) and which may contain, as heterocyclic ring atoms, in addition to the N-atom in the yl-position, further heteroatoms selected from the group consisting of N, O and S, and which is unsubstituted or substituted,

where each of the radicals R^a, R^b, R^c, R^d and R^e in the radicals X and Y is, in each case independently of one another and independently of the radical R, as defined for R or is a radical of the formula -OR*, where R* is, independently of R, as defined for R,

R^2 and R^6, in each case independently of one another, are hydrogen, halogen, SCN,

CN or an unsubstituted or substituted hydrocarbon radical,

R^3 (a) in the case that n = 0 is a radical selected from the group consisting of hydrogen, halogen, SCN and CN or a radical of the formula A^1 or B^1 or

(b) in the case that n = 1 is hydrogen or a radical of the formula A^1, B^1 or C^1 and

R^4 (a) in the case that m = 0 is a radical selected from the group consisting of hydrogen, halogen, SCN and CN or a radical of the formula A^2 or B^2 or

(b) in the case that m = 1 is hydrogen or a radical of the formula A^2, B^2 or C^2 and

R^5 (a) in the case o = 0 is hydrogen or a radical of the formula A^3 or B^3 or

(b) in the case o = 1 is hydrogen or a radical of the formula A^3, B^3 or C^3,

where each of the radicals A^1, A^2, A^3, in each case independently of one another, is an unsubstituted or substituted hydrocarbon radical,

each of the radicals B^1, B^2, B^3, in each case independently of one another, is an acyl radical and

each of the radicals C^1, C^2, C^3, in each case independently of one another, is an unsubstituted or substituted heterocyclic radical,

Z, Z', Z", in each case independently of one another, are a group of the formula O, $S(O)_x$ or NR', where x = 0, 1 or 2 and R' is hydrogen or an unsubstituted or substituted hydrocarbon radical or an unsubstituted or substituted hydrocarbonoxy radical or acyl or acyloxy,

m is an integer 0 or 1,

n is an integer 0 or 1 and

o is an integer 0 or 1,

where the sum m + n + o is an integer 1, 2 or 3 and, in the case of the alternatives (b) defined above, at least one of the radicals R^3, R^4 and R^5 is selected from radicals from the group consisting of hydrogen and B^1, B^2 and B^3 (= acyl), respectively, as safeners or resistance inductors for crop plants or useful plants, preferably as safeners against phytotoxic actions of agrochemicals such as pesticides in these plants.

If, by a hydrogen shift, the compounds are capable of forming tautomers whose

structure is not formally covered by formula (I), these tautomers are nevertheless embraced by the definition of the compounds of the formula (I) according to the invention.

The formula (I) also embraces all stereoisomers of the compounds whose specific stereochemical configuration is not explicitly expressed by the formula, and mixtures thereof. Such compounds of the formula (I) contain one or more asymmetrically substituted C-atoms or else double bonds which are not specifically mentioned in the formulae (I). All possible stereoisomers defined by their specific spatial form, such as enantiomers, diastereomers, Z- and E-isomers, are embraced by the formula (I) and can be obtained by customary methods from mixtures of the stereoisomers or else by stereoselective reactions in combination with the use of stereochemically pure starting materials.

By addition of a suitable inorganic or organic acid, such as, for example, HCl, HBr, H_2SO_4 or HNO_3, or else oxalic acid or sulfonic acids, to a basic group, such as, for example, amino or alkylamino, the compounds of the formula (I) are capable of forming salts. Suitable substituents which are present in deprotonated form, such as, for example, sulfonic acids or carboxylic acids, are capable of forming inner salts with groups which for their part can be protonated, such as amino groups.
Salts can also be formed by replacing the hydrogen in suitable substituents, such as, for example, sulfonic acids or carboxylic acids, by an agriculturally suitable cation. These salts are, for example, metal salts, in particular alkali metal salts or alkaline earth metal salts, in particular sodium and potassium salts, or else ammonium salts, salts with organic amines or quaternary ammonium salts.

In the formula (I) and in all formulae below, the following definitions apply:

A hydrocarbon radical is an aliphatic, cycloaliphatic or aromatic monocyclic or, in the case of an unsubstituted or substituted hydrocarbon radical, also bicyclic or polycyclic organic radical based on the elements carbon and hydrogen, comprising, for example, the radicals alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl, phenyl, naphthyl, indanyl, indenyl, etc.; this applies correspondingly to hydrocarbonoxy

radicals.
Unless defined in more detail, the hydrocarbon and hydrocarbonoxy radicals in the above definitions preferably have 1 to 20 C-atoms, particularly preferably 1 to 16 C-atoms, in particular 1 to 12 C-atoms.

The carbon skeleton of the hydrocarbon radicals and the specific radicals alkyl, alkoxy, haloalkyl, haloalkoxy, alkylamino and alkylthio and the corresponding unsaturated and/or substituted radicals can in each case be straight-chain or branched.
The term "(C_1-C_4)-alkyl" is an abbreviated notation for open-chain alkyl having one to 4 carbon atoms, i.e. it comprises the radicals methyl, ethyl, 1-propyl, 2-propyl, 1-butyl, 2-butyl, 2-methylpropyl and tert-butyl. Correspondingly, general alkyl radicals having a wider stated range of carbon atoms, for example "(C_1-C_6)-alkyl", also comprise straight-chain or branched alkyl radicals having a larger number of carbon atoms, i.e., according to the example, also the alkyl radicals having 5 and 6 C-atoms. Unless specifically indicated, the lower carbon skeletons, for example those having 1 to 6 C-atoms or, in the case of unsaturated groups, having 2 to 6 C-atoms, are preferred for the hydrocarbon radicals, such as alkyl, alkenyl and alkynyl radicals. Alkyl radicals, including in the composite meaning, such as alkoxy, haloalkyl, etc., are, for example, methyl, ethyl, n- or i-propyl, n-, i-, t- or 2-butyl, pentyls, hexyls, such as n-hexyl, isohexyl and 1,3-dimethylbutyl, heptyls, such as n-heptyl, 1-methylhexyl and 1,4-dimethylpentyl; alkenyl and alkynyl radicals denote the possible unsaturated radicals which correspond to the meaning of the alkyl radicals; alkenyl is, for example, vinyl, allyl, 1-methyl-2-propenyl, 2-methyl-2-propenyl, 2-butenyl, pentenyl, 2-methylpentenyl or hexenyl, preferably allyl, 1-methylprop-2-en-1-yl, 2-methylprop-2-en-1-yl, but-2-en-1-yl, but-3-en-1-yl, 1-methylbut-3-en-1-yl or 1-methylbut-2-en-1-yl. (C_2-C_6)-alkynyl is, for example, ethynyl, propargyl, 1-methyl-2-propynyl, 2-methyl-2-propynyl, 2-butynyl, 2-pentynyl or 2-hexynyl, preferably propargyl, but-2-yn-1-yl, but-3-yn-1-yl or 1-methyl-but-3-yn-1-yl.

Alkylidene, for example also in the form of (C_1-C_{10})-alkylidene, denotes the radical of a straight-chain or branched alkane which is attached via a double bond, where the

position of the point of attachment has not yet been determined. In the case of a branched alkane, of course, only those positions are suitable where two hydrogen atoms can be replaced by the double bond; such radicals are, for example, $=CH_2$, $=CH\text{-}CH_3$, $=C(CH_3)\text{-}CH_3$, $=C(CH_3)\text{-}C_2H_5$ or $=C(C_2H_5)\text{-}C_2H_5$.

Cycloalkyl denotes a carbocyclic saturated ring system having preferably 3-8 carbon atoms, for example cyclopropyl, cyclobutyl, cyclopentyl or cyclohexyl. Substituted cycloalkyl comprises cyclic systems having substituents, including substituents having a double bond to the cycloalkyl radical, for example an alkylidene group, such as methylidene. Substituted cycloalkyl also comprises polycyclic aliphatic systems, such as, for example, bicyclo[1.1.0]butan-1-yl, bicyclo[1.1.0]butan-2-yl, bicyclo-[2.1.0]pentan-1-yl, bicyclo[2.1.0]pentan-2-yl, bicyclo[2.1.0]pentan-5-yl, adamantan-1-yl and adamantan-2-yl.

Cycloalkenyl denotes a carbocyclic non-aromatic partially unsaturated ring system having preferably 4-8 carbon atoms, for example 1-cyclobutenyl, 2-cyclobutenyl, 1-cyclopentenyl, 2-cyclopentenyl, 3-cyclopentenyl, or 1-cyclohexenyl, 2-cyclo-hexenyl, 3-cyclohexenyl, 1,3-cyclohexadienyl or 1,4-cyclohexadienyl. In the case of substituted cycloalkenyl, the comments for substituted cycloalkyl apply correspondingly.

Halogen denotes, for example, fluorine, chlorine, bromine or iodine. Haloalkyl, -alkenyl and -alkynyl denote alkyl, alkenyl and alkynyl, respectively, which are partially or fully substituted by identical or different halogen atoms, preferably selected from the group consisting of fluorine, chlorine and bromine, in particular the group consisting of fluorine and chlorine, for example monohaloalkyl, perhaloalkyl, CF_3, CHF_2, CH_2F, CF_3CF_2, CH_2FCHCl, CCl_3, $CHCl_2$, CH_2CH_2Cl; haloalkoxy is, for example, OCF_3, $OCHF_2$, OCH_2F, CF_3CF_2O, OCH_2CF_3 and OCH_2CH_2Cl; this applies correspondingly to haloalkenyl and other halogen-substituted radicals.

Aryl denotes a mono-, bi- or polycyclic aromatic system, for example phenyl, naphthyl, tetrahydronaphthyl, indenyl, indanyl, pentalenyl, fluorenyl and the like,

preferably phenyl.

A heterocyclic radical or ring (heterocyclyl) can be saturated, unsaturated or hetero-aromatic; unless defined otherwise, it preferably contains one or more, in particular 1, 2 or 3, heteroatoms in the heterocyclic ring, preferably selected from the group consisting of N, O and S; it is preferably an aliphatic heterocyclyl radical having 3 to 7 ring atoms or a heteroaromatic radical having 5 or 6 ring atoms. The heterocyclic radical can, for example, be a heteroaromatic radical or ring (heteroaryl), such as, for example, a mono-, bi- or polycyclic aromatic system in which at least 1 ring contains one or more heteroatoms. It is preferably a heteroaromatic ring having a heteroatom selected from the group consisting of N, O and S, for example pyridyl, pyrrolyl, thienyl or furyl; moreover, it is preferably a corresponding heteroaromatic ring having 2 or 3 heteroatoms, for example pyrimidinyl, pyridazinyl, pyrazinyl, triazinyl, thiazolyl, thiadiazolyl, oxazolyl, isoxazolyl, pyrazolyl, imidazolyl and triazolyl. Moreover, it is preferably a partially or fully hydrogenated heterocyclic radical having a heteroatom selected from the group consisting of N, O and S, for example oxiranyl, oxetanyl, oxolanyl (= tetrahydrofuryl), oxanyl, pyrrolinyl, pyrrolidyl or piperidyl.

Moreover, it is preferably a partially or fully hydrogenated heterocyclic radical having 2 heteroatoms selected from the group consisting of N, O and S, for example piperazinyl, dioxolanyl, oxazolinyl, isoxazolinyl, oxazolidinyl, isoxazolidinyl and morpholinyl.

Suitable substituents for a substituted heterocyclic radical are the substituents mentioned further below, and additionally also oxo. The oxo group may also be present on the heterocyclic ring atoms which can exist in various oxidation states, for example on N and S.

Preferred examples of heterocyclyl are heterocyclic radicals having 3 to 6 ring atoms selected from the group consisting of pyridyl, thienyl, furyl, pyrrolyl, oxiranyl, 2-oxetanyl, 3-oxetanyl, oxolanyl (= tetrahydrofuryl), pyrrolidyl, piperidyl, in particular oxiranyl, 2-oxetanyl, 3-oxetanyl or oxolanyl, or heterocyclic radicals having two or

three heteroatoms, for example pyrimidinyl, pyridazinyl, pyrazinyl, triazinyl, thienyl, thiazolyl, thiadiazolyl, oxazolyl, isoxazolyl, pyrazolyl, triazolyl, piperazinyl, dioxolanyl, oxazolinyl, isoxazolinyl, oxazolidinyl, isoxazolidinyl or morpholinyl.

If a basic structure is substituted "by one or more radicals" from a list of radicals (= group) or a generically defined group of radicals, this includes in each case the simultaneous substitution by a plurality of identical and/or structurally different radicals.

Substituted radicals, such as substituted alkyl, alkenyl, alkynyl, aryl, phenyl, benzyl, heterocyclyl and heteroaryl radicals, are, for example, substituted radicals derived from an unsubstituted basic structure, the substituents being, for example, one or more, preferably 1, 2 or 3, radicals selected from the group consisting of halogen, alkoxy, alkylthio, hydroxyl, amino, nitro, carboxyl, cyano, azido, alkoxycarbonyl, alkylcarbonyl, formyl, carbamoyl, mono- and dialkylaminocarbonyl, substituted amino, such as acylamino, mono- and dialkylamino, and alkylsulfinyl, alkylsulfonyl and, in the case of cyclic radicals, also alkyl, haloalkyl, alkylthioalkyl, alkoxyalkyl, unsubstituted or substituted mono- and dialkylamino and hydroxyalkyl; the term "substituted radicals" such as substituted alkyl, etc. includes, as substituents, in addition to the saturated hydrocarbon-containing radicals mentioned, corresponding unsaturated aliphatic and aromatic radicals, such as unsubstituted or substituted alkenyl, alkynyl, alkenyloxy, alkynyloxy, phenyl, phenoxy, etc. Substituted cyclic radicals having aliphatic moieties in the ring also include cyclic systems having substituents attached to the ring via a double bond, for example those which are substituted by an alkylidene group, such as methylidene or ethylidene, or an oxo group, imino group or substituted imino group.

The substituents mentioned by way of example ("first substituent level") can, if they contain hydrocarbon-containing moieties, be, if appropriate, substituted further in the moieties ("second substituent level"), for example by one of the substituents as defined for the first substituent level. Corresponding further substituent levels are possible. The term "substituted radical" preferably embraces only one or two

substituent levels.

Preferred substituents for the substituent levels are, for example,

amino, hydroxyl, halogen, nitro, cyano, mercapto, carboxyl, carboxamide, SF_5, aminosulfonyl, alkyl, cycloalkyl, alkenyl, cycloalkenyl, alkynyl, monoalkylamino, dialkylamino, N-alkanoylamino, alkoxy, alkenyloxy, alkynyloxy, cycloalkoxy, cycloalkenyloxy, alkoxycarbonyl, alkenyloxycarbonyl, alkynyloxycarbonyl, aryloxycarbonyl, alkanoyl, alkenylcarbonyl, alkynylcarbonyl, arylcarbonyl, alkylthio, cycloalkylthio, alkenylthio, cycloalkenylthio, alkynylthio, alkylsulfinyl, alkylsulfonyl, monoalkylaminosulfonyl, dialkylaminosulfonyl, N-alkylaminocarbonyl, N,N-dialkyl-aminocarbonyl, N-alkanoylaminocarbonyl, N-alkanoyl-N-alkylaminocarbonyl, aryl, aryloxy, benzyl, benzyloxy, benzylthio, arylthio, arylamino and benzylamino.

In the case of radicals having carbon atoms, preference is given to those having 1 to 6 carbon atoms, preferably 1 to 4 carbon atoms, in particular 1 or 2 carbon atoms. Preference is generally given to substituents selected from the group consisting of halogen, for example fluorine and chlorine, (C_1-C_4)-alkyl, preferably methyl or ethyl, (C_1-C_4)-haloalkyl, preferably trifluoromethyl, (C_1-C_4)-alkoxy, preferably methoxy or ethoxy, (C_1-C_4)-haloalkoxy, nitro and cyano. Here, particular preference is given to the substituents methyl, methoxy, fluorine and chlorine.

Substituted amino, such as mono- or disubstituted amino, denotes a radical from the group of the substituted amino radicals which are substituted, for example, by one or two identical or different radicals selected from the group consisting of alkyl, alkoxy, acyl and aryl; preferably mono- and dialkylamino, mono- and diarylamino, acylamino, N-alkyl-N-arylamino, N-alkyl-N-acylamino and N-heterocycles; here, preference is given to alkyl radicals having 1 to 4 carbon atoms; aryl is preferably phenyl or substituted phenyl; for acyl, the definition given further down applies, preference is given to (C_1-C_4)-alkanoyl. This applies correspondingly to substituted hydroxylamino or hydrazino.

Unsubstituted or substituted phenyl is preferably phenyl which is unsubstituted or mono- or polysubstituted, preferably up to trisubstituted, by identical or different radicals selected from the group consisting of halogen, (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkyl, (C_1-C_4)-haloalkoxy and nitro, for example o-, m- and p-tolyl, dimethylphenyls, 2-, 3- and 4-chlorophenyl, 2-, 3- and 4-trifluoro- and -trichloro-phenyl, 2,4-, 3,5-, 2,5- and 2,3-dichlorophenyl, o-, m- and p-methoxyphenyl.

Acyl denotes a radical of an organic acid which, formally, is formed by removing a hydroxyl group from the acid function, it also being possible for the organic radical in the acid to be attached to the acid function via a heteroatom. Examples of acyl are the radicals -CO-R of a carboxylic acid HO-CO-R and radicals of acids derived therefrom, such as thiocarboxylic acid, unsubstituted or N-substituted iminocarboxylic acids or the radicals of carbonic acid monoesters, N-substituted carbamic acid, sulfonic acids, sulfinic acids, N-substituted sulfonamido acids, phosphonic acids, phosphinic acids.

Acyl denotes, for example, formyl, alkylcarbonyl, such as [(C_1-C_4)-alkyl]carbonyl, phenylcarbonyl, alkyloxycarbonyl, phenyloxycarbonyl, benzyloxycarbonyl, alkylsulfonyl, alkylsulfinyl, N-alkyl-1-iminoalkyl and other radicals of organic acids. Here, the radicals may in each case be substituted further in the alkyl or phenyl moiety, for example in the alkyl moiety by one or more radicals selected from the group consisting of halogen, alkoxy, phenyl and phenoxy; examples of substituents in the phenyl moiety are the substituents which have already been mentioned further up in a general manner for substituted phenyl.

Acyl denotes preferably an acyl radical in the narrower sense, i.e. a radical of an organic acid where the acid group is attached directly to the carbon atom of an organic radical, for example formyl, alkylcarbonyl, such as acetyl or [(C_1-C_4)alkyl]carbonyl, phenylcarbonyl, alkylsulfonyl, alkylsulfinyl and other radicals of organic acids.

If a general radical is defined as "hydrogen", this means a hydrogen atom.

The "yl-position" of a radical denotes its point of attachment.

Hereinbelow, compounds of formula (I) and salts thereof which can be used according to the invention are, in short, also referred to as "compounds (I) according to the invention".

In particular for reasons of a more pronounced crop-plant-protecting or useful-plant-protecting action, better selectivity and/or better preparability, those compounds of the formula (I) according to the invention mentioned or salts thereof are of particular interest when individual radicals have one of the preferred meanings already mentioned or mentioned below, and in particular those which contain a combination of one or more of the preferred meanings already mentioned or mentioned below.

Of particular interest is the use according to the invention of compounds of the formula (I) or salts thereof in which R^1 is a nitrile group (-CN).

Of particular interest is also the use according to the invention of compounds of the formula (I) or salts thereof where

R^1 is a radical of the formula -C(=X)-Y-R or -C(=X)-Het,
in which

X is a divalent radical of the formula O, S or NR^a or N-NR^aR^b, where R^a and R^b are as defined below,

Y is a group of the formula O, S, NR^c or NR^c-NR^dR^e, where R^c, R^d and R^e are as defined below,

R is hydrogen, (C_1-C_{18})-alkyl, (C_2-C_{18})-alkenyl, (C_2-C_{18})-alkynyl, (C_3-C_9)-cycloalkyl, (C_5-C_9)-cycloalkenyl, (C_3-C_9)-cycloalkyl-(C_1-C_{12})-alkyl, phenyl, phenyl-(C_1-C_{12})-alkyl, heterocyclyl or heterocyclyl-(C_1-C_{12})-alkyl,

where each of the 10 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, amino, cyano, nitro, thiocyanato,

(C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_2-C_4)-alkenyloxy, (C_2-C_4)-haloalkenyloxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl, (C_1-C_4)-haloalkylsulfonyl, mono-(C_1-C_4)-alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl, or

(C_1-C_6)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, phenylcarbonyl, phenoxycarbonyl, [phenyl-(C_1-C_4)-alkyl]carbonyl, [phenyl-(C_1-C_4)-alkoxy]carbonyl, where the phenyl ring of each of the 4 last-mentioned radicals is unsubstituted or substituted, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl or (C_1-C_4)-haloalkylsulfonyl,

and, including substituents, has 1 to 30 C-atoms, preferably 1 to 20 C-atoms, in particular 1 to 16 C-atoms, and/or

Het is an aliphatic N-heterocycle having a total of 1 to 3 heterocyclic ring atoms and a total of 5 or 6 ring atoms, which is attached via a heterocyclic ring N-atom to the group C(=X) and which may contain, as heterocyclic ring atoms, in addition to the N-atom in the yl-position, further heteroatoms selected from the group consisting of N, O and S and which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, amino, (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkyl, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio and oxo,

where each of the radicals R^a, R^b, R^c, R^d and R^e in the radicals X and Y, in each case independently of one another and independently of the radical R, is as defined for R or a radical of the formula -OR*, where R*, independently of R, is as defined for R, and

R^2 and R^6, in each case independently of one another, are hydrogen, halogen, SCN,

CN, (C_1-C_4)-alkyl, (C_2-C_4)-alkenyl, (C_2-C_4)-alkynyl or (C_3-C_6)-cycloalkyl, where each of the 4 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, amino, cyano, nitro, thiocyanato, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl, (C_1-C_4)-haloalkylsulfonyl, mono-(C_1-C_4)-alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl,

and/or

R^3 (a) in the case that n = 0 is a radical selected from the group consisting of hydrogen, halogen, SCN and CN or a radical of the formula A^1 or B^1 or

(b) in the case that n = 1 is hydrogen or a radical of the formula A^1, B^1 or C^1 and

R^4 (a) in the case that m = 0 is a radical selected from the group consisting of hydrogen, halogen, SCN and CN or a radical of the formula A^2 or B^2 or

(b) in the case that m = 1 is hydrogen or a radical of the formula A^2, B^2 or C^2 and

R^5 (a) in the case that o = 0 is hydrogen or a radical of the formula A^3 or B^3 or

(b) in the case that o = 1 is hydrogen or a radical of the formula A^3, B^3 or C^3,

where each of the radicals A^1, A^2, A^3, in each case independently of one another, is hydrogen, (C_1-C_{18})-alkyl, (C_2-C_{18})-alkenyl, (C_2-C_{18})-alkynyl, (C_3-C_9)-cycloalkyl, (C_5-C_9)-cycloalkenyl, (C_3-C_9)-cycloalkyl-(C_1-C_{12})-alkyl, phenyl, phenyl-(C_1-C_{12})-alkyl, heterocyclyl or heterocyclyl-(C_1-C_{12})-alkyl, where each of the 10 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, amino, cyano, nitro, thiocyanato, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_2-C_4)-alkenyloxy, (C_2-C_4)-haloalkenyloxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl,

(C_1-C_4)-haloalkylsulfonyl, mono-(C_1-C_4)-alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl,

and has, including substituents, 1 to 30 C-atoms, preferably 1 to 20 C-atoms, in particular 1 to 16 C-atoms,

and/or

where each of the radicals B^1, B^2, B^3, in each case independently of one another, is (C_1-C_6)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, phenylcarbonyl, phenoxycarbonyl, [phenyl-(C_1-C_4)-alkyl]carbonyl, [phenyl-(C_1-C_4)-alkoxy]carbonyl, where the phenyl ring of each of the 4 last-mentioned radicals may be unsubstituted or substituted, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]-carbonyl, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl or (C_1-C_4)-haloalkylsulfonyl

and/or

where each of the radicals C^1, C^2, C^3, in each case independently of one another, is an aliphatic or aromatic heterocycle having a total of 1 to 3 heterocyclic ring atoms selected from the group consisting of N, O and S and a total of 5 or 6 ring atoms, which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, amino, (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkyl, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio and oxo,

and/or

Z, Z', Z'', in each case independently of one another, are a group of the formula O, $S(O)_x$ or NR',

where x = 0, 1 or 2 and R' is hydrogen, (C_1-C_4)-alkyl, (C_2-C_4)-alkenyl, (C_2-C_4)-alkynyl, (C_3-C_6)-cycloalkyl, (C_1-C_4)-alkoxy, (C_2-C_4)-alkenyloxy, (C_2-C_4)-alkynyloxy or (C_3-C_6)-cycloalkyloxy,

where each of the 8 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting

of halogen, hydroxyl, amino, cyano, nitro, thiocyanato, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl, (C_1-C_4)-haloalkylsulfonyl, mono-(C_1-C_4)-alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl, or

(C_1-C_6)-alkanoyl, (C_1-C_4)-haloalkanoyl, (C_1-C_6)-alkanoyloxy, (C_1-C_4)-haloalkanoyloxy, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, [(C_1-C_4)-alkoxy]carbonyloxy, [(C_1-C_4)-haloalkoxy]carbonyloxy, phenylcarbonyl, phenoxycarbonyl, [phenyl-(C_1-C_4)-alkyl]carbonyl, [phenyl-(C_1-C_4)-alkoxy]-carbonyl, phenylcarbonyloxy, phenoxycarbonyloxy, [phenyl-(C_1-C_4)-alkyl]-carbonyloxy or [phenyl-(C_1-C_4)-alkoxy]carbonyloxy, where the phenyl ring of each of the 8 last-mentioned radicals is unsubstituted or substituted, or amino-carbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl or (C_1-C_4)-haloalkylsulfonyl,

m is an integer 0 or 1,

n is an integer 0 or 1 and

o is an integer 0 or 1,

where the sum m + n + o is an integer 1, 2 or 3 and, in the case of the alternatives (b) defined above, at least one of the radicals R^3, R^4 and R^5 is selected from radicals from the group consisting of hydrogen and a radical of the formula B^1, B^2 and B^3, respectively.

Of particular interest is also the use according to the invention of compounds of the formula (I) or salts thereof where

R^1 is a radical of the formula -C(=X)-Y-R or -C(=X)-Het,

in which

X is a divalent radical of the formula O, S or NR^a or N-NR^aR^b, where R^a and R^b are as defined below,

Y is a group of the formula O, S, NR^c or NR^c-NR^dR^e, where R^c, R^d and R^e are as defined below,

R is hydrogen, (C_1-C_{12})-alkyl, (C_2-C_{12})-alkenyl, (C_2-C_{12})-alkynyl, (C_3-C_6)-cycloalkyl, (C_5-C_6)-cycloalkenyl, (C_3-C_6)-cycloalkyl-(C_1-C_4)-alkyl, phenyl, phenyl-(C_1-C_4)-alkyl, heterocyclyl or heterocyclyl-(C_1-C_4)-alkyl,

where each of the 10 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_2-C_4)-alkenyloxy, (C_2-C_4)-haloalkenyloxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl, (C_1-C_4)-haloalkylsulfonyl, mono-(C_1-C_4)-alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl,

or

(C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, phenylcarbonyl, phenoxycarbonyl, [phenyl-(C_1-C_4)-alkyl]-carbonyl, [phenyl-(C_1-C_4)-alkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di[-(C_1-C_4)-alkylamino]carbonyl, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl or (C_1-C_4)-haloalkylsulfonyl and/or

Het is the radical of an aliphatic N-heterocycle selected from the group consisting of piperazinyl, piperidinyl, oxazolidinyl, isoxazolidinyl and morpholinyl, which is in each case attached via the N-ring atom and which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, amino, (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkyl, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio and oxo,

where each of the radicals R^a, R^b, R^c, R^d and R^e in the radicals X and Y, in each case independently of one another and of the radical R, is as defined for R or a radical of the formula -OR*, where R*, independently of R, is as defined for R.

Preference is given to the use according to the invention of compounds of the

formula (I) or salts thereof where

R^1 is a radical of the formula -C(=X)-Y-R,

in which

X is a divalent radical of the formula O, S or NR^a or N-NR^aR^b, preferably O or NR^a, where R^a and R^b are as defined below,

Y is a group of the formula O, S, NR^c or NR^c-NR^dR^e, preferably O or NR^c, where R^c, R^d and R^e are as defined below,

R is hydrogen, (C_1-C_8)-alkyl, (C_2-C_8)-alkenyl, (C_2-C_8)-alkynyl, (C_3-C_6)-cycloalkyl, (C_3-C_6)-cycloalkyl-(C_1-C_4)-alkyl, phenyl, phenyl-(C_1-C_4)-alkyl, heterocyclyl or heterocyclyl-(C_1-C_4)-alkyl,

where each of the 9 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, mono-(C_1-C_4)-alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl,

or

(C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, phenylcarbonyl, phenoxycarbonyl, [phenyl-(C_1-C_4)-alkyl]-carbonyl, [phenyl-(C_1-C_4)-alkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl or (C_1-C_4)-haloalkylsulfonyl,

where each of the radicals R^a, R^b, R^c, R^d and R^e in the radicals X and Y , in each case independently of one another and of the radical R, is as defined for R or a radical of the formula -OR*, where R*, independently of R, is as defined for R.

Particular preference is given to the use according to the invention of compounds of formula (I) or salts thereof where

R^1 is a radical of the formula

-CO-OR or

-C(=NR^a)-OR or

-CO-NR^cR ,

where R, R^a, R^b and R^c are as defined above;

preferably,

R^1 is a radical of the formula -CO-OR, where

R is hydrogen, (C_1-C_8)-alkyl, (C_2-C_8)-alkenyl, (C_2-C_8)-alkynyl, (C_3-C_6)-cycloalkyl, (C_3-C_6)-cycloalkyl-(C_1-C_4)-alkyl, phenyl, phenyl-(C_1-C_4)-alkyl, heterocyclyl or heterocyclyl-(C_1-C_4)-alkyl,

where each of the 9 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, mono-(C_1-C_4)-alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]-carbonyl and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl, and,

in particular

R is hydrogen, (C_1-C_6)-alkyl, (C_2-C_8)-alkenyl, (C_2-C_8)-alkynyl, (C_3-C_6)-cycloalkyl, or (C_3-C_6)-cycloalkyl-(C_1-C_4)-alkyl,

where each of the 5 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-alkylthio and, in the case of cyclic radicals, also (C_1-C_4)-alkyl.

Very preferably, R^1 is a radical of the formula

-CO-OH or

-CO-O^- M^+ or

-CO-OR ,

where

R is (C_1-C_4)-alkyl, which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy and (C_1-C_4)-alkylthio, and

M^+ is an agriculturally suitable cation, preferably one cation equivalent of an alkali metal or alkaline earth metal, in particular a sodium ion or potassium ion, or else an

unsubstituted or substituted ammonium ion, preferably NH_4^+ or an ammonium ion of an organic amine or a quaternary ammonium ion.

Examples of such radicals are:

R^1 = carboxyl and salts thereof, methoxycarbonyl, ethoxycarbonyl, n-propoxycarbonyl, n-butoxycarbonyl, isopropoxycarbonyl, (2-hydroxyethoxy)-carbonyl.

Preferably, R^1 is also a radical of the formula

$-C(=NR^a)-OR$, where

R and R^a are as defined above, preferably

R is (C_1-C_8)-alkyl, (C_2-C_8)-alkenyl, (C_2-C_8)-alkynyl, (C_3-C_6)-cycloalkyl, (C_3-C_6)-cycloalkyl-(C_1-C_4)-alkyl, phenyl, phenyl-(C_1-C_4)-alkyl, heterocyclyl or heterocyclyl-(C_1-C_4)-alkyl,

where each of the 9 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, mono-(C_1-C_4)-alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl,

or

(C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, phenylcarbonyl, phenoxycarbonyl, [phenyl-(C_1-C_4)-alkyl]-carbonyl, [phenyl-(C_1-C_4)-alkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl or (C_1-C_4)-haloalkylsulfonyl

and

R^a is hydrogen or, independently of one another, defined as the radical R above, or, preferably,

(C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, phenylcarbonyl, phenoxycarbonyl, [phenyl-(C_1-C_4)-alkyl]-carbonyl, [phenyl-(C_1-C_4)-alkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-

alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl or (C_1-C_4)-haloalkylsulfonyl.

Examples of such radicals are:

R^1 = methoxyacetiminocarbonyl, ethoxyacetiminocarbonyl, n-propoxyacetiminocarbonyl, isopropoxyacetiminocarbonyl, (2-hydroxyethoxy)acetiminocarbonyl, acetoxyiminocarbonyl, acetoxymethyliminocarbonyl, acetoxyethyliminocarbonyl, acetoxyacetiminocarbonyl.

Preferably, R^1 is also a radical of the formula
-CO-NR^cR, where R and R^c are as defined above; preferably,

R is hydrogen, (C_1-C_8)-alkyl, (C_2-C_8)-alkenyl, (C_2-C_8)-alkynyl, (C_3-C_6)-cycloalkyl, (C_3-C_6)-cycloalkyl-(C_1-C_4)-alkyl, phenyl, phenyl-(C_1-C_4)-alkyl, heterocyclyl or heterocyclyl-(C_1-C_4)-alkyl,

where each of the 9 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, mono-(C_1-C_4)alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl,
or
(C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, phenylcarbonyl, phenoxycarbonyl, [phenyl-(C_1-C_4)-alkyl]-carbonyl, [phenyl-(C_1-C_4)-alkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl or (C_1-C_4)-haloalkylsulfonyl

and

R^c is hydrogen or, independently of one another, is defined as the radical R above, or, preferably,

R^c is hydrogen, (C_1-C_4)-alkyl, which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy and (C_1-C_4)-alkylthio,

or

(C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, (C_1-C_4)-alkylsulfinyl and (C_1-C_4)-alkylsulfonyl, or, in particular, hydrogen or (C_1-C_4)-alkyl.

Examples of such radicals are:

R^1 = aminocarbonyl, N-methylaminocarbonyl, N-ethylaminocarbonyl, N-(n-propyl)-aminocarbonyl, N-isopropylaminocarbonyl, N-butylaminocarbonyl, N-(2-hydroxyethyl)aminocarbonyl, N-cycopropylaminocarbonyl, N-acetylaminocarbonyl, N-propionylaminocarbonyl, N,N-dimethylaminocarbonyl, N,N-diethylaminocarbonyl, N-ethyl-N-methylaminocarbonyl, N-acetyl-N-methylaminocarbonyl.

Preference is given to the use according to the invention of compounds of the formula (I) or salts thereof where

R^2 and R^6, in each case independently of one another, are hydrogen, halogen, (C_1-C_4)-alkyl, which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl, (C_1-C_4)-haloalkylsulfonyl, mono-(C_1-C_4)-alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]-carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl and di-[(C_1-C_4)-alkylamino]carbonyl;

preferably,

R^2 and R^6, in each case independently of one another, are hydrogen, halogen, (C_1-C_4)-alkyl, (C_1-C_4)-hydroxyalkyl or (C_1-C_4)-haloalkyl.

Preference is given to the use according to the invention of compounds of the formula (I) or salts thereof where

R^3 (a) in the case that n = 0 is a radical selected from the group consisting of hydrogen, halogen, SCN and CN or a radical of the formula A^1 or B^1 or

(b) in the case that n = 1 is hydrogen or a radical of the formula A^1, B^1 or

C^1 and

R^4 (a) in the case that m = 0 is a radical selected from the group consisting of hydrogen, halogen, SCN and CN or a radical of the formula A^2 or B^2 or

(b) in the case that m = 1 is hydrogen or a radical of the formula A^2, B^2 or C^2 and

R^5 (a) in the case that o = 0 is hydrogen or a radical of the formula A^3 or B^3 or

(b) in the case that o = 1 is hydrogen or a radical of the formula A^3, B^3 or C^3,

where each of the radicals A^1, A^2, A^3, in each case independently of one another, is hydrogen, (C_1-C_{12})-alkyl, (C_2-C_{12})-alkenyl, (C_2-C_{12})-alkynyl, (C_3-C_6)-cycloalkyl, (C_5-C_6)-cycloalkenyl, (C_3-C_6)-cycloalkyl-(C_1-C_4)-alkyl, phenyl, phenyl-(C_1-C_4)-alkyl, heterocyclyl or heterocyclyl-(C_1-C_4)-alkyl,

where each of the 10 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, amino, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_2-C_4)-alkenyloxy, (C_2-C_4)-haloalkenyloxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl, (C_1-C_4)-haloalkylsulfonyl, mono-(C_1-C_4)-alkylamino, di-(C_1-C_4)-alkylamino, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, [(C_1-C_4)-haloalkoxy]carbonyl, aminocarbonyl, mono-[(C_1-C_4)-alkylamino]carbonyl, di-[(C_1-C_4)-alkylamino]carbonyl and, in the case cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl,

and, preferably,

each of the radicals A^1, A^2, A^3, in each case independently of one another, is hydrogen, (C_1-C_8)-alkyl, (C_2-C_8)-alkenyl, (C_2-C_8)-alkynyl or (C_3-C_6)-cycloalkyl, where each of the 4 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]-carbonyl and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl,

and/or

where each of the radicals B^1, B^2, B^3, in each case independently of one another, is (C_1-C_4)-alkanoyl, (C_1-C_4)-haloalkanoyl, [(C_1-C_4)-alkoxy]carbonyl, (C_1-C_4)-alkylsulfinyl, (C_1-C_4)-alkylsulfonyl, (C_1-C_4)-haloalkylsulfinyl or (C_1-C_4)-haloalkylsulfonyl or,

preferably, each of the radicals B^1, B^2, B^3, in each case independently of one another, is (C_1-C_4)-alkanoyl, [(C_1-C_4)-alkoxy]carbonyl or (C_1-C_4)-alkylsulfonyl, and/or

where each of the radicals C^1, C^2, C^3, in each case independently of one another, is an aliphatic or aromatic heterocycle having a total of 1 to 3 heterocyclic ring atoms selected from the group consisting of N, O and S and a total of 5 or 6 ring atoms, which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkyl, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkylthio and oxo, and

Z, Z', Z", in each case independently of one another, are a group of the formula O, S, SO, SO_2 or NR',

where R' is hydrogen, (C_1-C_4)-alkyl, (C_3-C_6)-cycloalkyl or (C_1-C_4)-alkoxy,

where each of the 3 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_1-C_4)alkylthio and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl, or

(C_1-C_6)-alkanoyl, (C_1-C_4)-haloalkanoyl, (C_1-C_6)-alkanoyloxy, (C_1-C_4)-haloalkanoyloxy, [(C_1-C_4)-alkoxy]carbonyl, phenylcarbonyl, [phenyl-(C_1-C_4)-alkyl]-carbonyl or [phenyl-(C_1-C_4)-alkoxy]carbonyl, where the phenyl ring of each of the 3 last-mentioned radicals is unsubstituted or substituted, or (C_1-C_4)-alkylsulfinyl or (C_1-C_4)-alkylsulfonyl, or,

preferably, Z, Z', Z", in each case independently of one another, are a radical of the formula O, or NR', where R' is hydrogen, (C_1-C_4)-alkyl or (C_3-C_6)-cycloalkyl,

where each of the 9 last-mentioned radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkoxy, (C_1-C_4)-alkyl-

thio and, in the case of cyclic radicals, also (C_1-C_4)-alkyl and (C_1-C_4)-haloalkyl, or

(C_1-C_6)-alkanoyl, (C_1-C_4)-haloalkanoyl or [(C_1-C_4)-alkoxy]carbonyl, and

m is an integer 0 or 1,

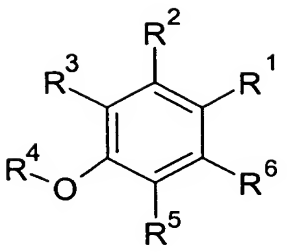
n is an integer 0 or 1 and

o is an integer 0 or 1,

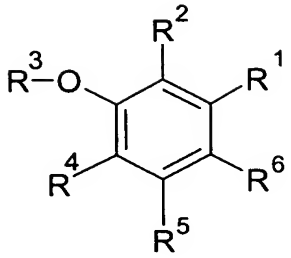
where the sum m + n + o is an integer 1, 2 or 3 and, in the case of the alternatives (b) defined above, at least one of the radicals R^3, R^4 and R^5 selected from radicals from the group consisting of hydrogen and a radical of the formula B^1, B^2 and B^3, respectively.

Very preferred is the use according to the invention of compounds of the formula (I) or salts thereof where
one, two or three of the radicals $R^3(Z)_n$, $R^4(Z')_m$ and $R^5(Z'')_o$ are a hydroxyl group or an acyloxy group, for example acetyloxy.

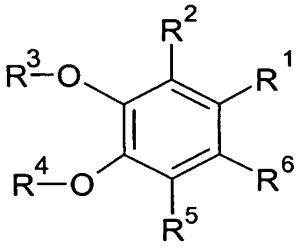
Of particular interest is the use of compounds of the formulae (Ia), (Ib), (Ic), (Id) and (Ie),



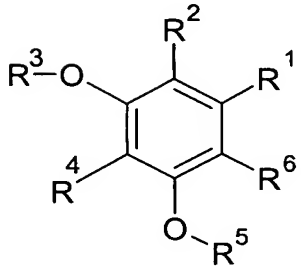
(Ia)



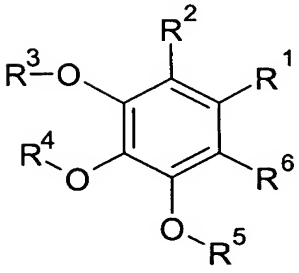
(Ib)



(Ic)



(Id)



(Ie)

where R^1 to R^5 are as defined and the radicals R^3, R^4 and R^5, which are attached to the oxygen atoms shown, are in each case hydrogen or an acyl radical as per B^1, B^2 or B^3; preferably, at least one of the radicals attached to oxygen is hydrogen.

Examples of compounds (I) to be used according to the invention are listed in the tables below.

Some of the compounds of the formula (I) are known or can be prepared analogously to known processes. Their use as safeners or resistance inductors in plants has hitherto not been known.

Some compounds of the formula (I) or salts thereof (hereinbelow together referred to as "compounds (I) according to the invention" or "compounds (I)" or "safeners") are novel and also form part of the subject-matter of the invention.

The compounds of the formula (I) can be prepared by derivatizing, for example acylating or etherifying, the hydroxybenzoates and their carboxyl derivatives as parent compounds by customary methods.

The invention also provides a method for protecting crop plants or useful plants against phytotoxic actions of agrochemicals, such as pesticides, or against environmental factors which cause damage to plants, which method comprises using compounds of the formula (I) or salts thereof as safeners or resistance inductors, preferably by applying an effective amount of the compounds of the formula (I) or their salts to the plants, to parts of plants or seeds or propagation material.

The safeners, together with active compounds (pesticides) are suitable for the selective control of harmful organisms in a number of plant crops, for example in crops of economic importance, such as cereals (wheat, barley, triticale, rye, rice, corn, millet), sugar beet, sugar cane, oilseed rape, cotton and soybeans. Of particular interest is the use in monocotyledonous crops, such as cereals (wheat, barley, triticale, sorghum), including corn and rice, and monocotyledonous vegetable crops, but also in dicotyledonous crops, such as, for example, soybean, oilseed rape, cotton, grape vines, vegetable plants, fruit plants and ornamental plants. Also of interest are mutant crops which are partially tolerant to some pesticides or transgenic crops which are partially tolerant, for example corn crops resistant to glufosinate or glyphosate, or soybean crops resistant to herbicidal imidazolinones. However, the particular advantage of the novel use of the safeners is their effective action in crops which are normally not tolerant to the pesticides mentioned.

For the joint use with pesticides, the compounds of the formula (I) according to the invention can be applied simultaneously with the active compounds or in any order, and they are then capable of reducing or completely eliminating harmful side-effects

of these active compounds in crop plants, without negatively affecting or substantially reducing the activity of these active compounds against unwanted harmful organisms. Here, even damage caused by using a plurality of pesticides, for example a plurality of herbicides or herbicides in combination with insecticides or fungicides, can be reduced substantially or eliminated completely. In this manner, it is possible to extend the field of use of conventional herbicides considerably.

If the compositions according to the invention comprise pesticides, these compositions are, after appropriate dilution, applied either directly to the area under cultivation, to the already germinated harmful and/or useful plants or to the already emerged harmful and/or useful plants. If the compositions according to the invention do not comprise any pesticide, these compositions can be employed by the tank mix method - i.e. the user mixes and dilutes the separately available products (= the pesticide and the agent protecting the useful plants) immediately prior to application to the area to be treated - or prior to the application of a pesticide, or after the application of a pesticide, or for the pretreatment of seed, i.e., for example, for dressing the seed of the useful plants.

The advantageous actions of the compounds (I) according to the invention are observed when they are used together with the pesticides by the pre-emergence method or the post-emergence method, for example in the case of simultaneous application as a tank mix or a coformulation or in the case of a separate application, in parallel or in succession (split application). It is also possible to repeat the application a number of times. In some cases, it may be expedient to combine a pre-emergence application with a post-emergence application. In most cases, one option is a post-emergence application to the useful plant or crop plant together with a simultaneous or later application of the pesticide. Also possible is the use of the compounds (I) according to the invention for seed dressing, for (dip) treatment of seedlings or for the treatment of other propagation material (for example potato tubers).

When using the compounds (I) according to the invention in combination with

herbicides, in addition to the safener action, enhanced herbicidal action against harmful plants is frequently also observed. Furthermore, in many cases, there is an improved growth of the useful plants and crop plants, and it is possible to increase the harvest yields.
Some of the last-mentioned advantageous actions are also observed when the compounds (I) are used without additional pesticides, in particular when other environmental factors negatively affect plant growth.

The compositions according to the invention may comprise one or more pesticides. Suitable pesticides are, for example, herbicides, insecticides, fungicides, acaricides and nematicides, which, when used on their own, would cause phytotoxic damage to the crop plants or would probably cause damage. Of particular interest are corresponding pesticidally active compounds from the groups of the herbicides, insecticides, acaricides, nematicides and fungicides, in particular herbicides.

The weight ratio of safener to pesticide can be varied within wide limits and is generally in the range from 1:100 to 100:1, preferably from 1:20 to 20:1, in particular from 1:10 to 10:1. The optimum weight ratio of safener to pesticide depends both on the respective safener used and the respective pesticide, and on the type of useful plant or crop plant to be protected. The required application rate of safener can, depending on the pesticide used and the type of useful plant to be protected, be varied within wide limits and is generally in the range from 0.001 to 10 kg, preferably from 0.005 to 5 kg, in particular from 0.1 to 1 kg, of safener per hectare.

For seed dressing, for example, from 0.005 to 20 g of safener per kilogram of seed, preferably from 0.01 to 10 g of safener per kilogram of seed, in particular from 0.05 to 5 g of safener per kilogram of seed, are used.

If solutions of safener are used for seed dressing and the seeds or seedlings are wetted with the solutions, the suitable concentration is generally in the range from 1 to 10 000 ppm, preferably from 100 to 1 000 ppm, based on the weight. The amounts and weight ratios required for a successful treatment can be determined by

simple preliminary experiments.

The safeners can be formulated in the customary manner, separately or together with the pesticides. Accordingly, the present invention also provides the useful-plant-protecting or crop-plant-protecting compositions.

Insecticides which, on their own or together with herbicides, can cause damage to plants include, for example:
organophosphates, for example terbufos (Counter®), fonofos (Dyfonate®), phorate (Thimet®), chlorpyriphos (Reldan®), carbamates, such as carbofuran (Furadan®), pyrethroid insecticides, such as tefluthrin (Force®), deltamethrin (Decis®) and tralomethrin (Scout®), and other insecticidal agents having a different mechanism of action.

Herbicides whose phytotoxic side effects on crop plants can be reduced using compounds of the formula I can be from entirely different structural classes and have entirely different mechanisms of action. Preference is given to commercially available herbicides as described, for example, in the handbook "The Pesticide Manual", 13th Edition 2003, The British Crop Protection Council, and the e-Pesticide Manual Version 3 (2003), or else names which are referred to in the "Compendium of Pesticide Common Names" (searchable via the Internet) and in literature quoted therein. The herbicides and plant growth regulators mentioned hereinbelow by way of example are in each case referred to by their standardized common active compound name according to the "International Organization for Standardization" (ISO), or by the chemical name and the code number. Examples of active compounds whose phytotoxic action in crop plants and useful plants can be reduced by the compounds (I) according to the invention are:
acetochlor; acifluorfen(-sodium); aclonifen; AKH 7088, i.e. [[[1-[5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrophenyl]-2-methoxyethylidene]amino]oxy]acetic acid and its methyl ester; alachlor; alloxydim(-sodium); ametryn; amicarbazone, amidochlor, amidosulfuron; aminopyralid, amitrol; AMS, i.e. ammonium sulfamate; anilofos; asulam; atrazine; azafenidin; azimsulfuron (DPX-A8947); aziprotryn; barban;

BAS 516 H, i.e. 5-fluoro-2-phenyl-4H-3,1-benzoxazin-4-one; beflubutamid; benazolin(-ethyl); benfluralin; benfuresate; bensulfuron(-methyl); bensulide; bentazone(-sodium); benzfendizone, benzobicyclone; benzofenap; benzofluor; benzoylprop(-ethyl); benzthiazuron; bialaphos (bilanafos); bifenox; bispyribac-(-sodium); bromacil; bromobutide; bromofenoxim; bromoxynil; bromuron; buminafos; busoxinone; butachlor; butafenacil; butamifos; butenachlor; buthidazole; butralin; butroxydim; butylate; cafenstrole (CH-900); carbetamide; carfentrazone(-ethyl); caloxydim, CDAA, i.e. 2-chloro-N,N-di-2-propenylacetamide; CDEC, i.e. 2-chloroallyl diethyldithiocarbamate; chlomethoxyfen; chloramben; chlorazifop-butyl; chlorbromuron; chlorbufam; chlorfenac; chlorfenprop, chlorflurenol-methyl; chloridazon; chlorimuron(-ethyl); chlornitrofen; chlorotoluron; chloroxuron; chlorpropham; chlorsulfuron; chlorthal-dimethyl; chlorthiamid; chlortoluron, cinidon-(-methyl or -ethyl), cinmethylin; cinosulfuron; clethodim; clefoxydim, clodinafop and its ester derivatives (for example clodinafop-propargyl); clomazone; clomeprop; cloprop, cloproxydim; clopyralid; clopyrasulfuron(-methyl); cloransulam(-methyl); cumyluron (JC 940); cyanazine; cycloate; cyclosulfamuron (AC 104); cycloxydim; cycluron; cyhalofop and its ester derivatives (for example butyl ester, DEH-112); cyperquat; cyprazine; cyprazole; daimuron; 2,4-D; 2,4-DB; dalapon; dazomet, desmedipham; desmetryn; di-allate; dicamba; dichlobenil; dichlorprop(-P); diclofop and its esters such as diclofop-methyl; diclosulam, diethatyl(-ethyl); difenoxuron; difenzoquat; diflufenican; diflufenzopyr; dimefuron; dimepiperate; dimethachlor; dimethametryn; dimethenamid (SAN-582H); dimethenamid(-P); dimethazone, dimethipin; dimexyflam, dimetrasulfuron, dinitramine; dinoseb; dinoterb; diphenamid; dipropetryn; diquat; dithiopyr; diuron; DNOC; eglinazine-ethyl; EL 77, i.e. 5-cyano-1-(1,1-dimethylethyl)-N-methyl-1H-pyrazole-4-carboxamide; endothal; epoprodan, EPTC; esprocarb; ethalfluralin; ethametsulfuron-methyl; ethidimuron; ethiozin; ethofumesate; ethoxyfen and its esters (for example ethyl ester, HC-252), ethoxysulfuron, etobenzanid (HW 52); F5231, i.e. N-[2-chloro-4-fluoro-5-[4-(3-fluoropropyl)-4,5-dihydro-5-oxo-1H-tetrazol-1-yl]-phenyl]ethanesulfonamide; fenoprop; fenoxan, fenoxaprop and fenoxaprop-P and their esters, for example fenoxaprop-P-ethyl and fenoxaprop-ethyl; fenoxydim; fentrazamide; fenuron; flamprop(-methyl or -isopropyl or -isopropyl-L); flazasulfuron; florasulam; fluazifop

and fluazifop-P and their esters, for example fluazifop-butyl and fluazifop-P-butyl; fluazolate, flucarbazone(-sodium); flucetosulfuron, fluchloralin; flufenacet (FOE 5043), flufenpyr, flumetsulam; flumeturon; flumiclorac(-pentyl); flumioxazin (S-482); flumipropyn; fluometuron; fluorochloridone, fluorodifen; fluoroglycofen(-ethyl); flupoxam (KNW-739); flupropacil (UBIC-4243); fluproanate, flupyrsulfuron(-methyl, or -sodium); flurenol(-butyl); fluridone; flurochloridone; fluroxypyr(-meptyl); flurprimidol, flurtamone; fluthiacet(-methyl); fluthiamide (also known as flufenacet); fomesafen; foramsulfuron; fosamine; furilazole (MON 13900), furyloxyfen; glufosinate(-ammonium); glyphosate(-isopropylammonium); halosafen; halosulfuron(-methyl) and its esters (for example the methyl ester, NC-319); haloxyfop and its esters; haloxyfop-P (= R-haloxyfop) and its esters; HC-252 (diphenylether), hexazinone; imazamethabenz(-methyl); imazamethapyr; imazamox; imazapic, imazapyr; imazaquin and salts such as the ammonium salts; imazethamethapyr; imazethapyr, imazosulfuron; indanofan; iodosulfuron-(methyl)-(sodium), ioxynil; isocarbamid; isopropalin; isoproturon; isouron; isoxaben; isoxachlortole; isoxaflutole; isoxapyrifop; karbutilate; lactofen; lenacil; linuron; MCPA; MCPA-thioethyl, MCPB; mecoprop(-P); mefenacet; mefluidid; mesosulfuron(-methyl); mesotrione; metam, metamifop, metamitron; metazachlor; methabenzthiazuron; methazole; methoxyphenone; methyldymron; metobenzuron, metobromuron; (S-)metolachlor; metosulam (XRD 511); metoxuron; metribuzin; metsulfuron-methyl; MK-616; molinate; monalide; monocarbamide dihydrogensulfate; monolinuron; monuron; MT 128, i.e. 6-chloro-N-(3-chloro-2-propenyl)-5-methyl-N-phenyl-3-pyridazinamine; MT 5950, i.e. N-[3-chloro-4-(1-methylethyl)-phenyl]-2-methylpentanamide; naproanilide; napropamide; naptalam; NC 310, i.e. 4-(2,4-dichlorobenzoyl)-1-methyl-5-benzyloxypyrazole; neburon; nicosulfuron; nipyraclophen; nitralin; nitrofen; nitrofluorfen; norflurazon; orbencarb; oryzalin; oxadiargyl (RP-020630); oxadiazone; oxasulfuron; oxaziclomefone; oxyfluorfen; paraquat; pebulate; pelargonic acid; pendimethalin; penoxulam; pentanochlor, pentoxazone; perfluidone; pethoxamid, phenisopham; phenmedipham; picloram; picolinafen; piperophos; piributicarb; pirifenop-butyl; pretilachlor; primisulfuron(-methyl); procarbazone(-sodium); procyazine; prodiamine; profluazole, profluralin; proglinazine(-ethyl); prometon; prometryn; propachlor; propanil; propaquizafop; propazine; propham; propisochlor; propoxycarbazone-

(-sodium), propyzamide; prosulfalin; prosulfocarb; prosulfuron (CGA-152005); prynachlor; pyraclonil, pyraflufen(-ethyl); pyrazolinate; pyrazon; pyrazosulfuron-(-ethyl); pyrazoxyfen; pyribenzoxim; pyributicarb; pyridafol; pyridate; pyriftalid, pyrimidobac(-methyl); pyrithiobac(-sodium) (KIH-2031); pyroxofop and its esters (for example propargyl ester); quinclorac; quinmerac; quinoclamine, quinofop and its ester derivatives, quizalofop and quizalofop-P and their ester derivatives, for example quizalofop-ethyl; quizalofop-P-tefuryl and -ethyl; renriduron; rimsulfuron (DPX-E 9636); S 275, i.e. 2-[4-chloro-2-fluoro-5-(2-propynyloxy)phenyl]-4,5,6,7-tetrahydro-2H-indazole; secbumeton; sethoxydim; siduron; simazine; simetryn; SN 106279, i.e. 2-[[7-[2-chloro-4-(trifluoromethyl)phenoxy]-2-naphthalenyl]oxy]propanoic acid and its methyl ester; sulcotrione; sulfentrazone (FMC-97285, F-6285); sulfazuron; sulfometuron(-methyl); sulfosate (ICI-A0224); sulfosulfuron; TCA; tebutam (GCP-5544); tebuthiuron; tepraloxydim; terbacil; terbucarb; terbuchlor; terbumeton; terbuthylazine; terbutryn; TFH 450, i.e. N,N-diethyl-3-[(2-ethyl-6-methylphenyl)sulfonyl]-1H-1,2,4-triazole-1-carboxamide; thenylchlor (NSK-850); thiafluamide; thiazafluron; thiazopyr (Mon-13200); thidiazimin (SN-24085); thidiazuron, thifensulfuron(-methyl); thiobencarb; tiocarbazil; tralkoxydim; tri-allate; triasulfuron; triaziflam; triazofenamide; tribenuron(-methyl); 2,3,6-trichlorobenzoic acid (2,3,6-TBA), triclopyr; tridiphane; trietazine; trifloxysulfuron(-sodium), trifluralin; triflusulfuron and esters (e.g. methyl ester, DPX-66037); trimeturon; tritosulfuron; tsitodef; vernolate; WL 110547, i.e. 5-phenoxy-1-[3-(trifluoromethyl)phenyl]-1H-tetrazole; UBH-509; D-489; LS 82-556; KPP-300; NC-324; NC-330; KH-218; DPX-N8189; SC-0774; DOWCO-535; DK-8910; V-53482; PP-600; MBH-001; KIH-9201; ET-751; KIH-6127; KIH-2023 and KIH5996.

Herbicides, whose phytotoxic side effects on crop plants can be reduced using compounds of the formula I are, for example, herbicides from the group of the carbamates, thiocarbamates, haloacetanilides, substituted phenoxy-, naphthoxy- and phenoxyphenoxycarboxylic acid derivatives and heteroaryloxyphenoxyalkane-carboxylic acid derivatives, such as quinolyloxy-, quinoxalyloxy-, pyridyloxy-, benzoxazolyloxy- and benzothiazolyloxyphenoxyalkanecarboxylic acid esters, cyclo-hexanedione oximes, benzoylcyclohexanediones, benzoylisoxazoles, benzoyl-

pyrazoles, imidazolinones, pyrimidinyloxypyridinecarboxylic acid derivatives, pyrimidyloxybenzoic acid derivatives, sulfonylureas, sulfonylaminocarbonyl-triazolinones, triazolopyrimidinesulfonamide derivatives, phosphinic acid derivatives and salts thereof, glycine derivatives, triazolinones, triazinones and also S-(N-aryl-N-alkylcarbamoylmethyl)dithiophosphoric esters, pyridinecarboxylic acids, pyridines, pyridinecarboxamides, 1,3,5-triazines and others.

Preference is given to phenoxyphenoxy- and heteroaryloxyphenoxycarboxylic acid esters and salts, cyclohexanedione oximes, benzoylcyclohexanediones, benzoyl-isoxazoles, sulfonylureas, sulfonylaminocarbonyltriazolinones, imidazolinones and mixtures of the active compounds mentioned with one another and/or with active compounds used for broadening the activity spectrum of the herbicides, for example bentazone, cyanazine, atrazine, bromoxynil, dicamba and other leaf-acting herbicides.

Herbicides which are suitable for combination with the safeners according to the invention are, for example:

A) herbicides of the type of the phenoxyphenoxy- and heteroaryloxyphenoxy-carboxylic acid derivatives, such as

A1) phenoxyphenoxy- and benzyloxyphenoxycarboxylic acid derivatives, for example methyl 2-(4-(2,4-dichlorophenoxy)phenoxy)propionate (diclofop-methyl),
methyl 2-(4-(4-bromo-2-chlorophenoxy)phenoxy)propionate (DE-A 26 01 548),
methyl 2-(4-(4-bromo-2-fluorophenoxy)phenoxy)propionate (US-A 4,808,750),
methyl 2-(4-(2-chloro-4-trifluoromethylphenoxy)phenoxy)propionate (DE-A 24 33 067),
methyl 2-(4-(2-fluoro-4-trifluoromethylphenoxy)phenoxy)propionate (US-A 4,808,750),
methyl 2-(4-(2,4-dichlorobenzyl)phenoxy)propionate (DE-A 24 17 487),
ethyl 4-(4-(4-trifluoromethylphenoxy)phenoxy)pent-2-enoate,
methyl 2-(4-(4-trifluoromethylphenoxy)phenoxy)propionate (DE-A 24 33 067),
butyl (*R*)-2-[4-(4-cyano-2-fluorophenoxy)phenoxy]propionate (cyhalofop-butyl)

A2) "monocyclic" heteroaryloxyphenoxyalkanecarboxylic acid derivatives, for example
ethyl 2-(4-(3,5-dichloropyridyl-2-oxy)phenoxy)propionate (EP-A 0 002 925),
propargyl 2-(4-(3,5-dichloropyridyl-2-oxy)phenoxy)propionate (EP-A 0 003 114),
methyl (*RS*)- or (*R*)-2-(4-(3-chloro-5-trifluoromethyl-2-pyridyloxy)phenoxy)propionate (haloxyfop-methyl or haloxyfop-P-methyl),
ethyl 2-(4-(3-chloro-5-trifluoromethyl-2-pyridyloxy)phenoxy)propionate (EP-A 0 003 890),
propargyl 2-(4-(5-chloro-3-fluoro-2-pyridyloxy)phenoxy)propionate (clodinafop-propargyl),
butyl (*RS*)- or (*R*)-2-(4-(5-trifluoromethyl-2-pyridyloxy)phenoxy)propionate (fluazifop-butyl or fluazifop-P-butyl),
(*R*)-2-[4-(3-chloro-5-trifluoromethyl-2-pyridyloxy)phenoxy]propionic acid;
A3) "bicyclic" heteroaryloxyphenoxyalkanecarboxylic acid derivatives, for example
methyl and ethyl (*RS*)- or (*R*)-2-(4-(6-chloro-2-quinoxalyloxy)phenoxy)propionate (quizalofop-methyl and -ethyl or quizalofop-P-methyl and -P-ethyl),
methyl 2-(4-(6-fluoro-2-quinoxalyloxy)phenoxy)propionate (see J. Pest. Sci. Vol. 10, 61 (1985)),
2-isopropylidenaminooxyethyl (*R*)-2-(4-(6-chloro-2-quinoxalyloxy)phenoxy)-propionate (propaquizafop),
ethyl (*RS*)- or (*R*)-2-(4-(6-chlorobenzoxazol-2-yloxy)phenoxy)propionate (fenoxaprop-ethyl or fenoxaprop-P-ethyl),
ethyl 2-(4-(6-chlorobenzthiazol-2-yloxy)phenoxy)propionate (DE-A-26 40 730),
tetrahydro-2-furylmethyl (*RS*)- or (*R*)-2-(4-(6-chloroquinoxalyloxy)phenoxy)propionate (EP-A-0 323 727);

B) herbicides from the group of the sulfonylureas, such as pyrimidinyl- or triazinylaminocarbonyl[benzene-, -pyridine-, -pyrazole-, -thiophene- and -(alkyl-sulfonyl)alkylamino]sulfamides. Preferred substituents on the pyrimidine ring or the triazine ring are alkoxy, alkyl, haloalkoxy, haloalkyl, halogen or dimethylamino, it

being possible to combine all substituents independently of one another. Preferred substituents in the benzene, pyridine, pyrazole, thiophene or (alkylsulfonyl)alkylamino moiety are alkyl, alkoxy, halogen, nitro, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkoxyaminocarbonyl, haloalkoxy, haloalkyl, alkylcarbonyl, alkoxyalkyl, (alkanesulfonyl)alkylamino. Such suitable sulfonylureas are, for example,

B1) phenyl- and benzylsulfonylureas and related compounds, for example

1-(2-chlorophenylsulfonyl)-3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)urea (chlorsulfuron),

1-(2-ethoxycarbonylphenylsulfonyl)-3-(4-chloro-6-methoxypyrimidin-2-yl)urea (chlorimuron-ethyl),

1-(2-methoxyphenylsulfonyl)-3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)urea (metsulfuron-methyl),

1-(2-chloroethoxyphenylsulfonyl)-3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)urea (triasulfuron),

1-(2-Methoxycarbonylphenylsulfonyl)-3-(4,6-dimethylpyrimidin-2-yl)harnstoff (sulfumeturon-methyl),

1-(2-methoxycarbonylphenylsulfonyl)-3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-3-methylurea (tribenuron-methyl),

1-(2-methoxycarbonylbenzylsulfonyl)-3-(4,6-dimethoxypyrimidin-2-yl)urea (bensulfuron-methyl),

1-(2-methoxycarbonylphenylsulfonyl)-3-(4,6-bis-(difluoromethoxy)pyrimidin-2-yl)urea, (primisulfuron-methyl),

3-(4-ethyl-6-methoxy-1,3,5-triazin-2-yl)-1-(2,3-dihydro-1,1-dioxo-2-methylbenzo[b]-thiophene-7-sulfonyl)urea (EP-A 0 796 83),

3-(4-ethoxy-6-ethyl-1,3,5-triazin-2-yl)-1-(2,3-dihydro-1,1-dioxo-2-methylbenzo[b]-thiophene-7-sulfonyl)urea (EP-A 0 079 683),

3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-1-(2-methoxycarbonyl-5-iodophenylsulfonyl)urea (WO 92/13845),

methyl 2-[4-dimethylamino-6-(2,2,2-trifluoroethoxy)-1,3,5-triazin-2-ylcarbamoylsulfamoyl]-3-methylbenzoate (DPX-66037, triflusulfuron-methyl),

oxetan-3-yl 2-[(4,6-dimethylpyrimidin-2-yl)carbamoylsulfamoyl]benzoate

(CGA-277476, oxasulfuron),
methyl 4-iodo-2-[3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)ureidosulfonyl]benzoate, sodium salt (iodosulfuron-methyl-sodium),
methyl 2-[3-(4,6-dimethoxypyrimidin-2-yl)ureidosulfonyl]-4-methanesulfonylamino-methylbenzoate (mesosulfuron-methyl, WO 95/10507),
N,N-dimethyl-2-[3-(4,6-dimethoxypyrimidin-2-yl)ureidosulfonyl]-4-formylamino-benzamide (foramsulfuron, WO 95/01344),
1-(4,6-dimethoxy-1,3,5-triazin-2-yl)-3-[2-(2-methoxyethoxy)phenylsulfonyl]urea (cinosulfuron),
methyl 2-[(4-ethoxy-6-methylamino-1,3,5-triazin-2-yl)carbamoylsulfamoyl]benzoate (ethametsulfuron-methyl),
1-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-3-[2-(3,3,3-trifluoropropyl)phenylsulfonyl]-urea (prosulfuron),
methyl 2-(4,6-dimethylpyrimidin-2-ylcarbamoylsulfamoyl)benzoate (sulfometuron-methyl),
1-(4-methoxy-6-trifluoromethyl-1,3,5-triazin-2-yl)-3-(2-trifluoromethyl-benzenesulfonyl)urea (tritosulfuron);

B2) thienylsulfonylureas, for example
1-(2-methoxycarbonylthiophen-3-yl)-3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)urea (thifensulfuron-methyl);

B3) pyrazolylsulfonylureas, for example
1-(4-ethoxycarbonyl-1-methylpyrazol-5-ylsulfonyl)-3-(4,6-dimethoxypyrimidin-2-yl)-urea (pyrazosulfuron-ethyl),
methyl 3-chloro-5-(4,6-dimethoxypyrimidin-2-ylcarbamoylsulfamoyl)-1-methyl-pyrazole-4-carboxylate (halosulfuron-methyl),
methyl 5-(4,6-dimethylpyrimidin-2-yl-carbamoylsulfamoyl)-1-(2-pyridyl)pyrazole-4-carboxylate (NC-330, see Brighton Crop Prot. Conference 'Weeds' 1991, Vol. 1, p. 45 ff.),
1-(4,6-dimethoxypyrimidin-2-yl)-3-[1-methyl-4-(2-methyl-2*H*-tetrazol-5-yl)pyrazol-5-yl-sulfonyl]urea (DPX-A8947, azimsulfuron);

B4) sulfonediamide derivatives, for example
3-(4,6-dimethoxypyrimidin-2-yl)-1-(N-methyl-N-methylsulfonylaminosulfonyl)urea (amidosulfuron) and its structural analogs (EP-A 0 131 258 and Z. Pfl. Krankh. Pfl. Schutz, special issue XII, 489-497 (1990));

B5) pyridylsulfonylureas, for example
1-(3-N,N-dimethylaminocarbonylpyridin-2-ylsulfonyl)-3-(4,6-dimethoxypyrimidin-2-yl)-urea (nicosulfuron),
1-(3-ethylsulfonylpyridin-2-ylsulfonyl)-3-(4,6-dimethoxypyrimidin-2-yl)urea (rimsulfuron),
methyl 2-[3-(4,6-dimethoxypyrimidin-2-yl)ureidosulfonyl]-6-trifluoromethyl-3-pyridine-carboxylate, sodium salt (DPX-KE 459, flupyrsulfuron-methyl-sodium),
3-(4,6-dimethoxypyrimidin-2-yl)-1-(3-N-methylsulfonyl-N-methylaminopyridin-2-yl)-sulfonylurea or its salts (DE-A 40 00 503 and DE-A 40 30 577),
1-(4,6-dimethoxypyrimidin-2-yl)-3-(3-trifluoromethyl-2-pyridylsulfonyl)urea (flazasulfuron),
1-(4,6-dimethoxypyrimidin-2-yl)-3-[3-(2,2,2-trifluoroethoxy)-2-pyridylsulfonyl]urea sodium salt (trifloxysulfuron-sodium);

B6) alkoxyphenoxysulfonylureas, for example
3-(4,6-dimethoxypyrimidin-2-yl)-1-(2-ethoxyphenoxy)sulfonylurea or its salts (ethoxysulfuron);

B7) imidazolylsulfonylureas, for example
1-(4,6-dimethoxypyrimidin-2-yl)-3-(2-ethylsulfonylimidazo[1,2-a]pyridin-3-yl)sulfonyl-urea (MON 37500, sulfosulfuron),
1-(2-chloroimidazo[1,2-*a*]pyridin-3-ylsulfonyl)-3-(4,6-dimethoxypyrimidin-2-yl)urea (imazosulfuron);

B8) phenylaminosulfonylureas, for example
1-[2-(cyclopropylcarbonyl)phenylaminosulfonyl]-3-(4,6-dimethoxypyrimidin-2-yl)urea

(cyclosulfamuron);

C) chloroacetanilides, for example
acetochlor, alachlor, butachlor, dimethachlor, dimethenamid, metazachlor, metolachlor, S-metolachlor, pethoxamid, pretilachlor, propachlor, propisochlor and thenylchlor;

D) thiocarbamates, for example
S-ethyl N,N-dipropylthiocarbamate (EPTC),
S-ethyl N,N-diisobutylthiocarbamate (butylate);
cycloate, dimepiperate, esprocarb, molinate, orbencarb, pebulate, prosulfocarb, thiobencarb, tiocarbazil and tri-allate;

E) cyclohexanedione oximes, for example
alloxydim, butroxydim, clethodim, cloproxydim, cycloxydim, protoxydim, sethoxydim, tepraloxydim and tralkoxydim;

F) imidazolinones, for example
imazamethabenz-methyl, imazapic, imazamox, imazapyr, imazaquin and imazethapyr;

G) triazolopyrimidinesulfonamide derivatives, for example
chloransulam-methyl, diclosulam, florasulam, flumetsulam, metosulam and penoxulam;

H) benzoylcyclohexanediones, for example
2-(2-chloro-4-methylsulfonylbenzoyl)cyclohexane-1,3-dione (SC-0051, sulcotrione),
2-(2-nitrobenzoyl)-4,4-dimethylcyclohexane-1,3-dione (EP-A 0 274 634),
2-(2-nitro-3-methylsulfonylbenzoyl)-4,4-dimethylcyclohexane-1,3-dione (WO 91/13548),
2-[4-(methylsulfonyl)-2-nitrobenzoyl]-1,3-cyclohexanedione (mesotrione);

I) benzoylisoxazoles, for example
5-cyclopropyl-[2-(methylsulfonyl)-4-(trifluoromethyl)benzoyl]isoxazole (isoxaflutole);

J) benzoylpyrazoles, for example
2-[4-(2,4-dichloro-*m*-toluyl)-1,3-dimethylpyrazol-5-yloxy]-4'-methylacetophenone (benzofenap),
4-(2,4-dichlorobenzoyl)-1,3-dimethylpyrazol-5-yl toluene-4-sulfonate (pyrazolynate),
2-[4-(2,4-dichlorobenzoyl)-1,3-dimethylpyrazol-5-yloxy]acetophenone (pyrazoxyfen);

K) sulfonylaminocarbonyltriazolinones, for example
4,5-dihydro-3-methoxy-4-methyl-5-oxo-*N*-(2-trifluoromethoxyphenylsulfonyl)-1*H*-1,2,4-triazole-1-carboxamide sodium salt (flucarbazone-sodium),
methyl 2-(4,5-dihydro-4-methyl-5-oxo-3-propoxy-1*H*-1,2,4-triazol-1-yl)carboxamido-sulfonylbenzoate sodium salt (propoxycarbazone-Na);

L) triazolinones, for example
4-amino-*N*-*tert*-butyl-4,5-dihydro-3-isopropyl-5-oxo-1,2,4-1*H*-triazole-1-carboxamide (amicarbazone),
2-(2,4-dichloro-5-prop-2-ynyloxyphenyl)-5,6,7,8-tetrahydro-1,2,4-triazolo[4,3-*a*]-pyridin-3(2*H*)-one (azafenidin),
ethyl (*RS*)-2-chloro-3-[2-chloro-5-(4-difluoromethyl-4,5-dihydro-3-methyl-5-oxo-1*H*-1,2,4-triazol-1-yl)-4-fluorophenyl]propionate (carfentrazone-ethyl),
2',4'-dichloro-5'-(4-difluoromethyl-4,5-dihydro-3-methyl-5-oxo-1*H*-1,2,4-triazol-1-yl)-methanesulfonanilide (sulfentrazone);

M) phosphinic acids and derivatives, for example
4-[hydroxy(methyl)phosphinoyl]-L-homoalanyl-L-alanyl-L-alanine (bilanafos),
DL-homoalanin-4-yl(methyl)phosphinic acid ammonium salt (glufosinate-ammonium);

N) glycine derivatives, for example
N-(phosphonomethyl)glycine and its salts (glyphosate and salts, for example the

sodium salt or the isopropylammonium salt),
N-(phosphonomethyl)glycine trimesium salt (sulfosate);

O) pyrimidinyloxypyridinecarboxylic acid derivatives and pyrimidinyloxybenzoic acid derivatives, for example
benzyl 3-(4,6-dimethoxypyrimidin-2-yl)oxypyridine-2-carboxylate (EP-A 0 249 707),
methyl 3-(4,6-dimethoxypyrimidin-2-yl)oxypyridine-2-carboxylate (EP-A 0 249 707),
1-(ethoxycarbonyloxyethyl) 2,6-bis[(4,6-dimethoxypyrimidin-2-yl)oxy]benzoate (EP-A 0 472 113),
2,6-bis[(4,6-dimethoxypyrimidin-2-yl)oxy]benzoic acid (bispyribac-sodium),
pyribenzoxim, pyriftalid, pyriminobac-methyl and pyrithiobac-sodium;

P) S-(N-aryl-N-alkylcarbamoylmethyl)dithiophosphonic acid esters, such as S-[N-(4-chlorophenyl)-N-isopropylcarbamoylmethyl] O,O-dimethyl dithiophosphate (anilophos);

Q) triazinones, for example
3-cyclohexyl-6-dimethylamino-1-methyl-1,3,5-triazine-2,4-(1*H*,3*H*)-dione (hexazinone),
4-amino-4,5-dihydro-3-methyl-6-phenyl-1,2,4-triazin-5-one (metamitron),
4-amino-6-*tert*-butyl-4,5-dihydro-3-methylthio-1,2,4-triazin-5-one (metribuzin);

R) pyridinecarboxylic acids, for example
clopyralid, fluroxypyr, picloram and triclopyr;

S) pyridines, for example
dithiopyr and thiazopyr;

T) pyridinecarboxamides, for example
diflufenican and picolinafen;

U) 1,3,5-triazines, for example

ametryn, atrazine, cyanazine, dimethametrin, prometon, prometryn, propazine, simazine, symetryn, terbumeton, terbuthylazine, terbutryn and trietazine;

V) plant growth regulators, for example
forchlorfenuron and thidiazuron.

The herbicides of groups A to V are known, for example, from the respective abovementioned publications and from "The Pesticide Manual", The British Crop Protection Council, 13th Edition, 2003, or the e-Pesticide Manual, Version 3.0, British Crop Protection Council 2003.

The compounds of the formula (I) and their combinations with one or more of the abovementioned pesticides can be formulated in various ways, depending on the prevailing physicochemical and biological parameters. Examples of suitable formulation types are:

- emulsifiable concentrates which are prepared by dissolving the active compounds in an organic solvent, for example butanol, cyclohexanone, dimethylformamide, xylene or else relatively high-boiling hydrocarbons or mixtures of the organic solvents with addition of one or more ionic and/or nonionic surfactants (emulsifiers). Suitable emulsifiers are, for example, calcium alkylarylsulfonates, fatty acid polyglycol esters, alkyaryl polyglycol ethers, fatty alcohol polyglycol ethers, propylene oxide/ethylene oxide condensates, alkyl polyethers, sorbitan esters and polyoxyethylenesorbitan fatty acid esters;
- dusts, which are obtained by binding the active compounds with finely dispersed inorganic or organic substances, for example talc, natural clays, such as kaolin, bentonite and pyrophyllite, diatomaceous earth or meals;
- water- or oil-based suspension concentrates, which can be prepared, for example, by wet grinding using bead mills;
- water-soluble powders;
- water-soluble concentrates;

- granules, such as water-soluble granules, water-dispersible granules and granules for application by broadcasting and soil application;
- wettable powders which, in addition to active compound, also contain diluents or inert substances and surfactants;
- capsule suspensions and microcapsules;
- ultra-low-volume formulations.

The abovementioned formulation types are known to the person skilled in the art and described, for example, in: K. Martens, "Spray Drying Handbook", 3rd Ed., G. Goodwin Ltd., London, 1979; W. van Valkenburg, "Pesticide Formulations", Marcel Dekker, N.Y. 1973; Winnaker-Küchler, "Chemische Technologie" [Chemical Technology], volume 7, C. Hanser Verlag Munich, 4th edition 1986; "Perry's Chemical Engineer's Handbook", 5th Ed., McGraw-Hill, N.Y. 1973, pages 8-57.

The formulation auxiliaries required, such as inert materials, surfactants, solvents and other additives are also known and are described, for example, in: McCutcheon's "Detergents and Emulsifiers Annual", MC Publ. Corp., Ridgewood N.J.; C. Marsden, "Solvents Guide", 2nd Ed., Interscience, N.Y. 1963; H. von Olphen, "Introduction to Clay Colloid Chemistry", 2nd Ed., J. Wiley & Sons, N.Y.; Schönfeldt, "Grenzflächenaktive Äthylenoxidaddukte" [Surface-active ethylene oxide adducts], Wiss. Verlagsgesellschaft, Stuttgart 1976; Sisley and Wood, "Encyclopedia of Surface Active Agents", Chem. Publ. Co. Inc., N.Y. 1964; Watkins, "Handbook of Insecticide Dust Diluents and Carriers", 2nd Ed., Darland Books, Caldwell N.J.; Winnacker-Küchler, "Chemische Technologie", volume 7, C. Hanser Verlag Munich, 4th edition 1986.

In addition to the abovementioned formulation auxiliaries, the useful-plant-protecting compositions may comprise, if appropriate, customary tackifiers, wetting agents, dispersants, penetrants, emulsifiers, preservatives, antifreeze agents, fillers, carriers, colorants, anti-foams, evaporation inhibitors and pH or viscosity regulators.

Depending on the formulation type, the useful-plant-protecting compositions generally comprise 0.1 to 99% by weight, in particular 0.2 to 95% by weight, of one

or more safeners of the formula I or a combination of safener and pesticide. Furthermore, they comprise 1 to 99.9, in particular 4 to 99.5, % by weight of one or more solid or liquid additives and 0 to 25, in particular 0.1 to 25, % by weight of a surfactant. In emulsifiable concentrates, the concentration of active compound, i.e. the concentration of safener and/or pesticide, is generally 1 to 90, in particular 5 to 80, % by weight. Dusts usually comprise 1 to 30, preferably 5 to 20, % by weight of active compound. In wettable powders, the concentration of active compound is generally 10 to 90% by weight. In water-dispersible granules, the content of active compound is, for example, between 1 and 95% by weight, preferably between 10 and 80% by weight.

For use, the formulations, which are present in commercially available form, are, if appropriate, diluted in a customary manner, for example in the case of wettable powders, emulsifiable concentrates, dispersions and water-dispersible granules, with water. Preparations in the form of dusts, granules and sprayable solutions are usually not diluted with any further inert substances prior to use. The required application rate of the safeners varies with the external conditions such as, inter alia, temperature, humidity and the type of herbicide used.

In the examples below, which illustrate the invention but do not limit it, the amounts are based on weight, unless defined otherwise.

A) Chemical examples

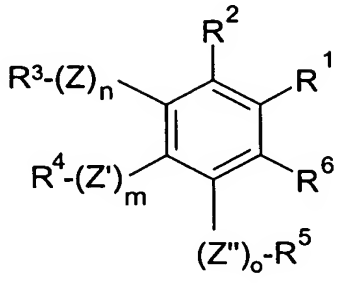
Example 1: Ethyl 3,4,5-triacetoxybenzoate

At 0°C, 1.00 g (0.0047 mol) of ethyl gallate is initially charged in 50 ml of dichloromethane, and a spatula-tip of dimethylaminopyridine (DMAP) and then, dropwise, 20 ml of acetic anhydride are added. The reaction mixture is stirred at room temperature for 18 hours and then concentrated under reduced pressure, the residue is taken up in dichloromethane and the mixture is then washed with water and 5% strength sodium bicarbonate solution. Drying over magnesium sulfate and

concentration using a rotary evaporator gives 1.43 g (90% of theory) of the desired product as an oil which, after a short while, solidifies to a crystalline mass.
M.p. 76-78°C.

Examples of compounds of (I) according to the invention are compiled in the table below:

Table 1: Compounds of the formula (I)



(I)

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1	CO-OH	H	OH	H	H	H	
2	CO-OMe	H	OH	H	H	H	
3	CO-OEt	H	OH	H	H	H	
4	CO-O-n-Pr	H	OH	H	H	H	
5	CO-O-n-Bu	H	OH	H	H	H	
6	CO-O-c-Pr	H	OH	H	H	H	
7	CO-O-CH_2CH_2OH	H	OH	H	H	H	
8	CO-O-$C_{12}H_{25}$	H	OH	H	H	H	
9	CO-O-$C_{16}H_{33}$	H	OH	H	H	H	
10	CO-NH_2	H	OH	H	H	H	
11	CO-NHMe	H	OH	H	H	H	
12	CO-NHEt	H	OH	H	H	H	
13	CO-NH-n-Pr	H	OH	H	H	H	
14	CO-NH-i-Pr	H	OH	H	H	H	
15	CO-NH-c-Pr	H	OH	H	H	H	
16	CO-NH-n-Pr	H	OH	H	H	H	
17	CO-NH-n-Bu	H	OH	H	H	H	
18	CO-NMe_2	H	OH	H	H	H	
19	CO-NEt_2	H	OH	H	H	H	
20	CO-$NHNH_2$	H	OH	H	H	H	
21	CN	H	OH	H	H	H	
22	CO-OH	H	OAc	H	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
23	CO-OMe	H	OAc	H	H	H	
24	CO-OEt	H	OAc	H	H	H	
25	CO-O-n-Pr	H	OAc	H	H	H	
26	CO-O-n-Bu	H	OAc	H	H	H	
27	CO-O-c-Pr	H	OAc	H	H	H	
28	CO-O-CH_2CH_2OH	H	OAc	H	H	H	
29	CO-O-$C_{12}H_{25}$	H	OAc	H	H	H	
30	CO-O-$C_{16}H_{33}$	H	OAc	H	H	H	
31	CO-NH_2	H	OAc	H	H	H	
32	CO-NHMe	H	OAc	H	H	H	
33	CO-NHEt	H	OAc	H	H	H	
34	CO-NH-n-Pr	H	OAc	H	H	H	
35	CO-NH-i-Pr	H	OAc	H	H	H	
36	CO-NH-c-Pr	H	OAc	H	H	H	
37	CO-NH-n-Pr	H	OAc	H	H	H	
38	CO-NH-n-Bu	H	OAc	H	H	H	
39	CO-NMe_2	H	OAc	H	H	H	
40	CO-NEt_2	H	OAc	H	H	H	
41	CO-$NHNH_2$	H	OAc	H	H	H	
42	CN	H	OAc	H	H	H	
43	CO-OH	H	OH	Me	H	H	
44	CO-OMe	H	OH	Me	H	H	
45	CO-OEt	H	OH	Me	H	H	
46	CO-O-n-Pr	H	OH	Me	H	H	
47	CO-O-n-Bu	H	OH	Me	H	H	
48	CO-O-c-Pr	H	OH	Me	H	H	
49	CO-O-CH_2CH_2OH	H	OH	Me	H	H	
50	CO-O-$C_{12}H_{25}$	H	OH	Me	H	H	
51	CO-O-$C_{16}H_{33}$	H	OH	Me	H	H	
52	CO-NH_2	H	OH	Me	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
53	CO-NHMe	H	OH	Me	H	H	
54	CO-NHEt	H	OH	Me	H	H	
55	CO-NH-n-Pr	H	OH	Me	H	H	
56	CO-NH-i-Pr	H	OH	Me	H	H	
57	CO-NH-c-Pr	H	OH	Me	H	H	
58	CO-NH-n-Pr	H	OH	Me	H	H	
59	CO-NH-n-Bu	H	OH	Me	H	H	
60	$CO-NMe_2$	H	OH	Me	H	H	
61	$CO-NEt_2$	H	OH	Me	H	H	
62	$CO-NHNH_2$	H	OH	Me	H	H	
63	CN	H	OH	Me	H	H	
64	CO-OH	H	OAc	Me	H	H	
65	CO-OMe	H	OAc	Me	H	H	
66	CO-OEt	H	OAc	Me	H	H	
67	CO-O-n-Pr	H	OAc	Me	H	H	
68	CO-O-n-Bu	H	OAc	Me	H	H	
69	CO-O-c-Pr	H	OAc	Me	H	H	
70	$CO-O-CH_2CH_2OH$	H	OAc	Me	H	H	
71	$CO-O-C_{12}H_{25}$	H	OAc	Me	H	H	
72	$CO-O-C_{16}H_{33}$	H	OAc	Me	H	H	
73	$CO-NH_2$	H	OAc	Me	H	H	
74	CO-NHMe	H	OAc	Me	H	H	
75	CO-NHEt	H	OAc	Me	H	H	
76	CO-NH-n-Pr	H	OAc	Me	H	H	
77	CO-NH-i-Pr	H	OAc	Me	H	H	
78	CO-NH-c-Pr	H	OAc	Me	H	H	
79	CO-NH-n-Pr	H	OAc	Me	H	H	
80	CO-NH-n-Bu	H	OAc	Me	H	H	
81	$CO-NMe_2$	H	OAc	Me	H	H	
82	$CO-NEt_2$	H	OAc	Me	H	H	
83	$CO-NHNH_2$	H	OAc	Me	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
84	CN	H	OAc	Me	H	H	
85	CO-OH	H	OH	H	Me	H	
86	CO-OMe	H	OH	H	Me	H	
87	CO-OEt	H	OH	H	Me	H	
88	CO-O-n-Pr	H	OH	H	Me	H	
89	CO-O-n-Bu	H	OH	H	Me	H	
90	CO-O-c-Pr	H	OH	H	Me	H	
91	CO-O-CH_2CH_2OH	H	OH	H	Me	H	
92	CO-O-$C_{12}H_{25}$	H	OH	H	Me	H	
93	CO-O-$C_{16}H_{33}$	H	OH	H	Me	H	
94	CO-NH_2	H	OH	H	Me	H	
95	CO-NHMe	H	OH	H	Me	H	
96	CO-NHEt	H	OH	H	Me	H	
97	CO-NH-n-Pr	H	OH	H	Me	H	
98	CO-NH-i-Pr	H	OH	H	Me	H	
99	CO-NH-c-Pr	H	OH	H	Me	H	
100	CO-NH-n-Pr	H	OH	H	Me	H	
101	CO-NH-n-Bu	H	OH	H	Me	H	
102	CO-NMe_2	H	OH	H	Me	H	
103	CO-NEt_2	H	OH	H	Me	H	
104	CO-$NHNH_2$	H	OH	H	Me	H	
105	CN	H	OH	H	Me	H	
106	CO-OH	H	OAc	H	Me	H	
107	CO-OMe	H	OAc	H	Me	H	
108	CO-OEt	H	OAc	H	Me	H	
109	CO-O-n-Pr	H	OAc	H	Me	H	
110	CO-O-n-Bu	H	OAc	H	Me	H	
111	CO-O-c-Pr	H	OAc	H	Me	H	
112	CO-O-CH_2CH_2OH	H	OAc	H	Me	H	
113	CO-O-$C_{12}H_{25}$	H	OAc	H	Me	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
114	CO-O-$C_{16}H_{33}$	H	OAc	H	Me	H	
115	CO-NH_2	H	OAc	H	Me	H	
116	CO-NHMe	H	OAc	H	Me	H	
117	CO-NHEt	H	OAc	H	Me	H	
118	CO-NH-n-Pr	H	OAc	H	Me	H	
119	CO-NH-i-Pr	H	OAc	H	Me	H	
120	CO-NH-c-Pr	H	OAc	H	Me	H	
121	CO-NH-n-Pr	H	OAc	H	Me	H	
122	CO-NH-n-Bu	H	OAc	H	Me	H	
123	CO-NMe_2	H	OAc	H	Me	H	
124	CO-NEt_2	H	OAc	H	Me	H	
125	CO-$NHNH_2$	H	OAc	H	Me	H	
126	CN	H	OAc	H	Me	H	
127	CO-OH	H	OH	H	H	Me	
128	CO-OMe	H	OH	H	H	Me	
129	CO-OEt	H	OH	H	H	Me	
130	CO-O-n-Pr	H	OH	H	H	Me	
131	CO-O-n-Bu	H	OH	H	H	Me	
132	CO-O-c-Pr	H	OH	H	H	Me	
133	CO-O-CH_2CH_2OH	H	OH	H	H	Me	
134	CO-O-$C_{12}H_{25}$	H	OH	H	H	Me	
135	CO-O-$C_{16}H_{33}$	H	OH	H	H	Me	
136	CO-NH_2	H	OH	H	H	Me	
137	CO-NHMe	H	OH	H	H	Me	
138	CO-NHEt	H	OH	H	H	Me	
139	CO-NH-n-Pr	H	OH	H	H	Me	
140	CO-NH-i-Pr	H	OH	H	H	Me	
141	CO-NH-c-Pr	H	OH	H	H	Me	
142	CO-NH-n-Pr	H	OH	H	H	Me	
143	CO-NH-n-Bu	H	OH	H	H	Me	
144	CO-NMe_2	H	OH	H	H	Me	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
145	CO-NEt_2	H	OH	H	H	Me	
146	CO-$NHNH_2$	H	OH	H	H	Me	
147	CN	H	OH	H	H	Me	
148	CO-OH	H	OAc	H	H	Me	
149	CO-OMe	H	OAc	H	H	Me	
150	CO-OEt	H	OAc	H	H	Me	
151	CO-O-n-Pr	H	OAc	H	H	Me	
152	CO-O-n-Bu	H	OAc	H	H	Me	
153	CO-O-c-Pr	H	OAc	H	H	Me	
154	CO-O-CH_2CH_2OH	H	OAc	H	H	Me	
155	CO-O-$C_{12}H_{25}$	H	OAc	H	H	Me	
156	CO-O-$C_{16}H_{33}$	H	OAc	H	H	Me	
157	CO-NH_2	H	OAc	H	H	Me	
158	CO-NHMe	H	OAc	H	H	Me	
159	CO-NHEt	H	OAc	H	H	Me	
160	CO-NH-n-Pr	H	OAc	H	H	Me	
161	CO-NH-i-Pr	H	OAc	H	H	Me	
162	CO-NH-c-Pr	H	OAc	H	H	Me	
163	CO-NH-n-Pr	H	OAc	H	H	Me	
164	CO-NH-n-Bu	H	OAc	H	H	Me	
165	CO-NMe_2	H	OAc	H	H	Me	
166	CO-NEt_2	H	OAc	H	H	Me	
167	CO-$NHNH_2$	H	OAc	H	H	Me	
168	CN	H	OAc	H	H	Me	
169	CO-OH	Me	OH	H	H	H	
170	CO-OMe	Me	OH	H	H	H	
171	CO-OEt	Me	OH	H	H	H	
172	CO-O-n-Pr	Me	OH	H	H	H	
173	CO-O-n-Bu	Me	OH	H	H	H	
174	CO-O-c-Pr	Me	OH	H	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
175	CO-O-CH_2CH_2OH	Me	OH	H	H	H	
176	CO-O-$C_{12}H_{25}$	Me	OH	H	H	H	
177	CO-O-$C_{16}H_{33}$	Me	OH	H	H	H	
178	CO-NH_2	Me	OH	H	H	H	
179	CO-NHMe	Me	OH	H	H	H	
180	CO-NHEt	Me	OH	H	H	H	
181	CO-NH-n-Pr	Me	OH	H	H	H	
182	CO-NH-i-Pr	Me	OH	H	H	H	
183	CO-NH-c-Pr	Me	OH	H	H	H	
184	CO-NH-n-Pr	Me	OH	H	H	H	
185	CO-NH-n-Bu	Me	OH	H	H	H	
186	CO-NMe_2	Me	OH	H	H	H	
187	CO-NEt_2	Me	OH	H	H	H	
188	CO-$NHNH_2$	Me	OH	H	H	H	
189	CN	Me	OH	H	H	H	
190	CO-OH	Me	OAc	H	H	H	
191	CO-OMe	Me	OAc	H	H	H	
192	CO-OEt	Me	OAc	H	H	H	
193	CO-O-n-Pr	Me	OAc	H	H	H	
194	CO-O-n-Bu	Me	OAc	H	H	H	
195	CO-O-c-Pr	Me	OAc	H	H	H	
196	CO-O-CH_2CH_2OH	Me	OAc	H	H	H	
197	CO-O-$C_{12}H_{25}$	Me	OAc	H	H	H	
198	CO-O-$C_{16}H_{33}$	Me	OAc	H	H	H	
199	CO-NH_2	Me	OAc	H	H	H	
200	CO-NHMe	Me	OAc	H	H	H	
201	CO-NHEt	Me	OAc	H	H	H	
202	CO-NH-n-Pr	Me	OAc	H	H	H	
203	CO-NH-i-Pr	Me	OAc	H	H	H	
204	CO-NH-c-Pr	Me	OAc	H	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
205	CO-NH-n-Pr	Me	OAc	H	H	H	
206	CO-NH-n-Bu	Me	OAc	H	H	H	
207	$CO-NMe_2$	Me	OAc	H	H	H	
208	$CO-NEt_2$	Me	OAc	H	H	H	
209	$CO-NHNH_2$	Me	OAc	H	H	H	
210	CN	Me	OAc	H	H	H	
211	CO-OH	H	H	OH	H	H	
212	CO-OMe	H	H	OH	H	H	
213	CO-OEt	H	H	OH	H	H	
214	CO-O-n-Pr	H	H	OH	H	H	
215	CO-O-n-Bu	H	H	OH	H	H	
216	CO-O-c-Pr	H	H	OH	H	H	
217	$CO-O-CH_2CH_2OH$	H	H	OH	H	H	
218	$CO-O-C_{12}H_{25}$	H	H	OH	H	H	
219	$CO-O-C_{16}H_{33}$	H	H	OH	H	H	
220	$CO-NH_2$	H	H	OH	H	H	
221	CO-NHMe	H	H	OH	H	H	
222	CO-NHEt	H	H	OH	H	H	
223	CO-NH-n-Pr	H	H	OH	H	H	
224	CO-NH-i-Pr	H	H	OH	H	H	
225	CO-NH-c-Pr	H	H	OH	H	H	
226	CO-NH-n-Pr	H	H	OH	H	H	
227	CO-NH-n-Bu	H	H	OH	H	H	
228	$CO-NMe_2$	H	H	OH	H	H	
229	$CO-NEt_2$	H	H	OH	H	H	
230	$CO-NHNH_2$	H	H	OH	H	H	
231	CN	H	H	OH	H	H	
232	CO-OH	H	H	OAc	H	H	
233	CO-OMe	H	H	OAc	H	H	
234	CO-OEt	H	H	OAc	H	H	
235	CO-O-n-Pr	H	H	OAc	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
236	CO-O-n-Bu	H	H	OAc	H	H	
237	CO-O-c-Pr	H	H	OAc	H	H	
238	CO-O-CH_2CH_2OH	H	H	OAc	H	H	
239	CO-O-$C_{12}H_{25}$	H	H	OAc	H	H	
240	CO-O-$C_{16}H_{33}$	H	H	OAc	H	H	
241	CO-NH_2	H	H	OAc	H	H	
242	CO-NHMe	H	H	OAc	H	H	
243	CO-NHEt	H	H	OAc	H	H	
244	CO-NH-n-Pr	H	H	OAc	H	H	
245	CO-NH-i-Pr	H	H	OAc	H	H	
246	CO-NH-c-Pr	H	H	OAc	H	H	
247	CO-NH-n-Pr	H	H	OAc	H	H	
248	CO-NH-n-Bu	H	H	OAc	H	H	
249	CO-NMe_2	H	H	OAc	H	H	
250	CO-NEt_2	H	H	OAc	H	H	
251	CO-$NHNH_2$	H	H	OAc	H	H	
252	CN	H	H	OAc	H	H	
253	CO-OH	Me	H	OH	H	H	
254	CO-OMe	Me	H	OH	H	H	
255	CO-OEt	Me	H	OH	H	H	
256	CO-O-n-Pr	Me	H	OH	H	H	
257	CO-O-n-Bu	Me	H	OH	H	H	
258	CO-O-c-Pr	Me	H	OH	H	H	
259	CO-O-CH_2CH_2OH	Me	H	OH	H	H	
260	CO-O-$C_{12}H_{25}$	Me	H	OH	H	H	
261	CO-O-$C_{16}H_{33}$	Me	H	OH	H	H	
262	CO-NH_2	Me	H	OH	H	H	
263	CO-NHMe	Me	H	OH	H	H	
264	CO-NHEt	Me	H	OH	H	H	
265	CO-NH-n-Pr	Me	H	OH	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
266	CO-NH-i-Pr	Me	H	OH	H	H	
267	CO-NH-c-Pr	Me	H	OH	H	H	
268	CO-NH-n-Pr	Me	H	OH	H	H	
269	CO-NH-n-Bu	Me	H	OH	H	H	
270	$CO-NMe_2$	Me	H	OH	H	H	
271	$CO-NEt_2$	Me	H	OH	H	H	
272	$CO-NHNH_2$	Me	H	OH	H	H	
273	CN	Me	H	OH	H	H	
274	CO-OH	Me	H	OAc	H	H	
275	CO-OMe	Me	H	OAc	H	H	
276	CO-OEt	Me	H	OAc	H	H	
277	CO-O-n-Pr	Me	H	OAc	H	H	
278	CO-O-n-Bu	Me	H	OAc	H	H	
279	CO-O-c-Pr	Me	H	OAc	H	H	
280	$CO-O-CH_2CH_2OH$	Me	H	OAc	H	H	
281	$CO-O-C_{12}H_{25}$	Me	H	OAc	H	H	
282	$CO-O-C_{16}H_{33}$	Me	H	OAc	H	H	
283	$CO-NH_2$	Me	H	OAc	H	H	
284	CO-NHMe	Me	H	OAc	H	H	
285	CO-NHEt	Me	H	OAc	H	H	
286	CO-NH-n-Pr	Me	H	OAc	H	H	
287	CO-NH-i-Pr	Me	H	OAc	H	H	
288	CO-NH-c-Pr	Me	H	OAc	H	H	
289	CO-NH-n-Pr	Me	H	OAc	H	H	
290	CO-NH-n-Bu	Me	H	OAc	H	H	
291	$CO-NMe_2$	Me	H	OAc	H	H	
292	$CO-NEt_2$	Me	H	OAc	H	H	
293	$CO-NHNH_2$	Me	H	OAc	H	H	
294	CN	Me	H	OAc	H	H	
295	CO-OH	H	H	OH	Me	H	
296	CO-OMe	H	H	OH	Me	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
297	CO-OEt	H	H	OH	Me	H	
298	CO-O-n-Pr	H	H	OH	Me	H	
299	CO-O-n-Bu	H	H	OH	Me	H	
300	CO-O-c-Pr	H	H	OH	Me	H	
301	CO-O-CH_2CH_2OH	H	H	OH	Me	H	
302	CO-O-$C_{12}H_{25}$	H	H	OH	Me	H	
303	CO-O-$C_{16}H_{33}$	H	H	OH	Me	H	
304	CO-NH_2	H	H	OH	Me	H	
305	CO-NHMe	H	H	OH	Me	H	
306	CO-NHEt	H	H	OH	Me	H	
307	CO-NH-n-Pr	H	H	OH	Me	H	
308	CO-NH-i-Pr	H	H	OH	Me	H	
309	CO-NH-c-Pr	H	H	OH	Me	H	
310	CO-NH-n-Pr	H	H	OH	Me	H	
311	CO-NH-n-Bu	H	H	OH	Me	H	
312	CO-NMe_2	H	H	OH	Me	H	
313	CO-NEt_2	H	H	OH	Me	H	
314	CO-$NHNH_2$	H	H	OH	Me	H	
315	CN	H	H	OH	Me	H	
316	CO-OH	H	H	OAc	Me	H	
317	CO-OMe	H	H	OAc	Me	H	
318	CO-OEt	H	H	OAc	Me	H	
319	CO-O-n-Pr	H	H	OAc	Me	H	
320	CO-O-n-Bu	H	H	OAc	Me	H	
321	CO-O-c-Pr	H	H	OAc	Me	H	
322	CO-O-CH_2CH_2OH	H	H	OAc	Me	H	
323	CO-O-$C_{12}H_{25}$	H	H	OAc	Me	H	
324	CO-O-$C_{16}H_{33}$	H	H	OAc	Me	H	
325	CO-NH_2	H	H	OAc	Me	H	
326	CO-NHMe	H	H	OAc	Me	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
327	CO-NHEt	H	H	OAc	Me	H	
328	CO-NH-n-Pr	H	H	OAc	Me	H	
329	CO-NH-i-Pr	H	H	OAc	Me	H	
330	CO-NH-c-Pr	H	H	OAc	Me	H	
331	CO-NH-n-Pr	H	H	OAc	Me	H	
332	CO-NH-n-Bu	H	H	OAc	Me	H	
333	$CO-NMe_2$	H	H	OAc	Me	H	
334	$CO-NEt_2$	H	H	OAc	Me	H	
335	$CO-NHNH_2$	H	H	OAc	Me	H	
336	CN	H	H	OAc	Me	H	
337	CO-OH	Me	H	OH	H	Me	
338	CO-OMe	Me	H	OH	H	Me	
339	CO-OEt	Me	H	OH	H	Me	
340	CO-O-n-Pr	Me	H	OH	H	Me	
341	CO-O-n-Bu	Me	H	OH	H	Me	
342	CO-O-c-Pr	Me	H	OH	H	Me	
343	$CO-O-CH_2CH_2OH$	Me	H	OH	H	Me	
344	$CO-O-C_{12}H_{25}$	Me	H	OH	H	Me	
345	$CO-O-C_{16}H_{33}$	Me	H	OH	H	Me	
346	$CO-NH_2$	Me	H	OH	H	Me	
347	CO-NHMe	Me	H	OH	H	Me	
348	CO-NHEt	Me	H	OH	H	Me	
349	CO-NH-n-Pr	Me	H	OH	H	Me	
350	CO-NH-i-Pr	Me	H	OH	H	Me	
351	CO-NH-c-Pr	Me	H	OH	H	Me	
352	CO-NH-n-Pr	Me	H	OH	H	Me	
353	CO-NH-n-Bu	Me	H	OH	H	Me	
354	$CO-NMe_2$	Me	H	OH	H	Me	
355	$CO-NEt_2$	Me	H	OH	H	Me	
356	$CO-NHNH_2$	Me	H	OH	H	Me	
357	CN	Me	H	OH	H	Me	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
358	CO-OH	Me	H	OAc	H	Me	
359	CO-OMe	Me	H	OAc	H	Me	
360	CO-OEt	Me	H	OAc	H	Me	
361	CO-O-n-Pr	Me	H	OAc	H	Me	
362	CO-O-n-Bu	Me	H	OAc	H	Me	
363	CO-O-c-Pr	Me	H	OAc	H	Me	
364	CO-O-CH_2CH_2OH	Me	H	OAc	H	Me	
365	CO-O-$C_{12}H_{25}$	Me	H	OAc	H	Me	
366	CO-O-$C_{16}H_{33}$	Me	H	OAc	H	Me	
367	CO-NH_2	Me	H	OAc	H	Me	
368	CO-NHMe	Me	H	OAc	H	Me	
369	CO-NHEt	Me	H	OAc	H	Me	
370	CO-NH-n-Pr	Me	H	OAc	H	Me	
371	CO-NH-i-Pr	Me	H	OAc	H	Me	
372	CO-NH-c-Pr	Me	H	OAc	H	Me	
373	CO-NH-n-Pr	Me	H	OAc	H	Me	
374	CO-NH-n-Bu	Me	H	OAc	H	Me	
375	CO-NMe_2	Me	H	OAc	H	Me	
376	CO-NEt_2	Me	H	OAc	H	Me	
377	CO-$NHNH_2$	Me	H	OAc	H	Me	
378	CN	Me	H	OAc	H	Me	
379	CO-OH	H	Me	OH	H	Me	
380	CO-OMe	H	Me	OH	H	Me	
381	CO-OEt	H	Me	OH	H	Me	
382	CO-O-n-Pr	H	Me	OH	H	Me	
383	CO-O-n-Bu	H	Me	OH	H	Me	
384	CO-O-c-Pr	H	Me	OH	H	Me	
385	CO-O-CH_2CH_2OH	H	Me	OH	H	Me	
386	CO-O-$C_{12}H_{25}$	H	Me	OH	H	Me	
387	CO-O-$C_{16}H_{33}$	H	Me	OH	H	Me	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
388	$CO\text{-}NH_2$	H	Me	OH	H	Me	
389	CO-NHMe	H	Me	OH	H	Me	
390	CO-NHEt	H	Me	OH	H	Me	
391	CO-NH-n-Pr	H	Me	OH	H	Me	
392	CO-NH-i-Pr	H	Me	OH	H	Me	
393	CO-NH-c-Pr	H	Me	OH	H	Me	
394	CO-NH-n-Pr	H	Me	OH	H	Me	
395	CO-NH-n-Bu	H	Me	OH	H	Me	
396	$CO\text{-}NMe_2$	H	Me	OH	H	Me	
397	$CO\text{-}NEt_2$	H	Me	OH	H	Me	
398	$CO\text{-}NHNH_2$	H	Me	OH	H	Me	
399	CO-OH	H	Me	OAc	H	Me	
400	CO-OMe	H	Me	OAc	H	Me	
401	CO-OEt	H	Me	OAc	H	Me	
402	CO-O-n-Pr	H	Me	OAc	H	Me	
403	CO-O-n-Bu	H	Me	OAc	H	Me	
404	CO-O-c-Pr	H	Me	OAc	H	Me	
405	$CO\text{-}O\text{-}CH_2CH_2OH$	H	Me	OAc	H	Me	
406	$CO\text{-}O\text{-}C_{12}H_{25}$	H	Me	OAc	H	Me	
407	$CO\text{-}O\text{-}C_{16}H_{33}$	H	Me	OAc	H	Me	
408	$CO\text{-}NH_2$	H	Me	OAc	H	Me	
409	CO-NHMe	H	Me	OAc	H	Me	
410	CO-NHEt	H	Me	OAc	H	Me	
411	CO-NH-n-Pr	H	Me	OAc	H	Me	
412	CO-NH-i-Pr	H	Me	OAc	H	Me	
413	CO-NH-c-Pr	H	Me	OAc	H	Me	
414	CO-NH-n-Pr	H	Me	OAc	H	Me	
415	CO-NH-n-Bu	H	Me	OAc	H	Me	
416	$CO\text{-}NMe_2$	H	Me	OAc	H	Me	
417	$CO\text{-}NEt_2$	H	Me	OAc	H	Me	
418	$CO\text{-}NHNH_2$	H	Me	OAc	H	Me	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
419	CN	H	Me	OAc	H	Me	
420	CO-OH	Me	Me	OH	H	H	
421	CO-OMe	Me	Me	OH	H	H	
422	CO-OEt	Me	Me	OH	H	H	
423	CO-O-n-Pr	Me	Me	OH	H	H	
424	CO-O-n-Bu	Me	Me	OH	H	H	
425	CO-O-c-Pr	Me	Me	OH	H	H	
426	CO-O-CH_2CH_2OH	Me	Me	OH	H	H	
427	CO-O-$C_{12}H_{25}$	Me	Me	OH	H	H	
428	CO-O-$C_{16}H_{33}$	Me	Me	OH	H	H	
429	CO-NH_2	Me	Me	OH	H	H	
430	CO-NHMe	Me	Me	OH	H	H	
431	CO-NHEt	Me	Me	OH	H	H	
432	CO-NH-n-Pr	Me	Me	OH	H	H	
433	CO-NH-i-Pr	Me	Me	OH	H	H	
434	CO-NH-c-Pr	Me	Me	OH	H	H	
435	CO-NH-n-Pr	Me	Me	OH	H	H	
436	CO-NH-n-Bu	Me	Me	OH	H	H	
437	CO-NMe_2	Me	Me	OH	H	H	
438	CO-NEt_2	Me	Me	OH	H	H	
439	CO-$NHNH_2$	Me	Me	OH	H	H	
440	CN	Me	Me	OH	H	H	
441	CO-OH	Me	Me	OAc	H	H	
442	CO-OMe	Me	Me	OAc	H	H	
443	CO-OEt	Me	Me	OAc	H	H	
444	CO-O-n-Pr	Me	Me	OAc	H	H	
445	CO-O-n-Bu	Me	Me	OAc	H	H	
446	CO-O-c-Pr	Me	Me	OAc	H	H	
447	CO-O-CH_2CH_2OH	Me	Me	OAc	H	H	
448	CO-O-$C_{12}H_{25}$	Me	Me	OAc	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
449	CO-O-$C_{16}H_{33}$	Me	Me	OAc	H	H	
450	CO-NH_2	Me	Me	OAc	H	H	
451	CO-NHMe	Me	Me	OAc	H	H	
452	CO-NHEt	Me	Me	OAc	H	H	
453	CO-NH-n-Pr	Me	Me	OAc	H	H	
454	CO-NH-i-Pr	Me	Me	OAc	H	H	
455	CO-NH-c-Pr	Me	Me	OAc	H	H	
456	CO-NH-n-Pr	Me	Me	OAc	H	H	
457	CO-NH-n-Bu	Me	Me	OAc	H	H	
458	CO-NMe_2	Me	Me	OAc	H	H	
459	CO-NEt_2	Me	Me	OAc	H	H	
460	CO-$NHNH_2$	Me	Me	OAc	H	H	
461	CN	Me	Me	OAc	H	H	
462	CO-OH	H	Me	OH	Me	H	
463	CO-OMe	H	Me	OH	Me	H	
464	CO-OEt	H	Me	OH	Me	H	
465	CO-O-n-Pr	H	Me	OH	Me	H	
466	CO-O-n-Bu	H	Me	OH	Me	H	
467	CO-O-c-Pr	H	Me	OH	Me	H	
468	CO-O-CH_2CH_2OH	H	Me	OH	Me	H	
469	CO-O-$C_{12}H_{25}$	H	Me	OH	Me	H	
470	CO-O-$C_{16}H_{33}$	H	Me	OH	Me	H	
471	CO-NH_2	H	Me	OH	Me	H	
472	CO-NHMe	H	Me	OH	Me	H	
473	CO-NHEt	H	Me	OH	Me	H	
474	CO-NH-n-Pr	H	Me	OH	Me	H	
475	CO-NH-i-Pr	H	Me	OH	Me	H	
476	CO-NH-c-Pr	H	Me	OH	Me	H	
477	CO-NH-n-Pr	H	Me	OH	Me	H	
478	CO-NH-n-Bu	H	Me	OH	Me	H	
479	CO-NMe_2	H	Me	OH	Me	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
480	CO-NEt_2	H	Me	OH	Me	H	
481	CO-$NHNH_2$	H	Me	OH	Me	H	
482	CN	H	Me	OH	Me	H	
483	CO-OH	H	Me	OAc	Me	H	
484	CO-OMe	H	Me	OAc	Me	H	
485	CO-OEt	H	Me	OAc	Me	H	
486	CO-O-n-Pr	H	Me	OAc	Me	H	
487	CO-O-n-Bu	H	Me	OAc	Me	H	
488	CO-O-c-Pr	H	Me	OAc	Me	H	
489	CO-O-CH_2CH_2OH	H	Me	OAc	Me	H	
490	CO-O-$C_{12}H_{25}$	H	Me	OAc	Me	H	
491	CO-O-$C_{16}H_{33}$	H	Me	OAc	Me	H	
492	CO-NH_2	H	Me	OAc	Me	H	
493	CO-NHMe	H	Me	OAc	Me	H	
494	CO-NHEt	H	Me	OAc	Me	H	
495	CO-NH-n-Pr	H	Me	OAc	Me	H	
496	CO-NH-i-Pr	H	Me	OAc	Me	H	
497	CO-NH-c-Pr	H	Me	OAc	Me	H	
498	CO-NH-n-Pr	H	Me	OAc	Me	H	
499	CO-NH-n-Bu	H	Me	OAc	Me	H	
500	CO-NMe_2	H	Me	OAc	Me	H	
501	CO-NEt_2	H	Me	OAc	Me	H	
502	CO-$NHNH_2$	H	Me	OAc	Me	H	
503	CN	H	Me	OAc	Me	H	
504	CO-OH	H	OH	OH	H	H	
505	CO-OMe	H	OH	OH	H	H	
506	CO-OEt	H	OH	OH	H	H	
507	CO-O-n-Pr	H	OH	OH	H	H	
508	CO-O-n-Bu	H	OH	OH	H	H	
509	CO-O-c-Pr	H	OH	OH	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
510	CO-O-CH_2CH_2OH	H	OH	OH	H	H	
511	CO-O-$C_{12}H_{25}$	H	OH	OH	H	H	
512	CO-O-$C_{16}H_{33}$	H	OH	OH	H	H	
513	CO-NH_2	H	OH	OH	H	H	
514	CO-NHMe	H	OH	OH	H	H	
515	CO-NHEt	H	OH	OH	H	H	
516	CO-NH-n-Pr	H	OH	OH	H	H	
517	CO-NH-i-Pr	H	OH	OH	H	H	
518	CO-NH-c-Pr	H	OH	OH	H	H	
519	CO-NH-n-Pr	H	OH	OH	H	H	
520	CO-NH-n-Bu	H	OH	OH	H	H	
521	CO-NMe_2	H	OH	OH	H	H	
522	CO-NEt_2	H	OH	OH	H	H	
523	CO-$NHNH_2$	H	OH	OH	H	H	
524	CN	H	OH	OH	H	H	
525	CO-OH	H	OAc	OH	H	H	
526	CO-OMe	H	OAc	OH	H	H	
527	CO-OEt	H	OAc	OH	H	H	
528	CO-O-n-Pr	H	OAc	OH	H	H	
529	CO-O-n-Bu	H	OAc	OH	H	H	
530	CO-O-c-Pr	H	OAc	OH	H	H	
531	CO-O-CH_2CH_2OH	H	OAc	OH	H	H	
532	CO-O-$C_{12}H_{25}$	H	OAc	OH	H	H	
533	CO-O-$C_{16}H_{33}$	H	OAc	OH	H	H	
534	CO-NH_2	H	OAc	OH	H	H	
535	CO-NHMe	H	OAc	OH	H	H	
536	CO-NHEt	H	OAc	OH	H	H	
537	CO-NH-n-Pr	H	OAc	OH	H	H	
538	CO-NH-i-Pr	H	OAc	OH	H	H	
539	CO-NH-c-Pr	H	OAc	OH	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
540	CO-NH-n-Pr	H	OAc	OH	H	H	
541	CO-NH-n-Bu	H	OAc	OH	H	H	
542	$CO-NMe_2$	H	OAc	OH	H	H	
543	$CO-NEt_2$	H	OAc	OH	H	H	
544	$CO-NHNH_2$	H	OAc	OH	H	H	
545	CN	H	OAc	OH	H	H	
546	CO-OH	H	OH	OAc	H	H	
547	CO-OMe	H	OH	OAc	H	H	
548	CO-OEt	H	OH	OAc	H	H	
549	CO-O-n-Pr	H	OH	OAc	H	H	
550	CO-O-n-Bu	H	OH	OAc	H	H	
551	CO-O-c-Pr	H	OH	OAc	H	H	
552	$CO-O-CH_2CH_2OH$	H	OH	OAc	H	H	
553	$CO-O-C_{12}H_{25}$	H	OH	OAc	H	H	
554	$CO-O-C_{16}H_{33}$	H	OH	OAc	H	H	
555	$CO-NH_2$	H	OH	OAc	H	H	
556	CO-NHMe	H	OH	OAc	H	H	
557	CO-NHEt	H	OH	OAc	H	H	
558	CO-NH-n-Pr	H	OH	OAc	H	H	
559	CO-NH-i-Pr	H	OH	OAc	H	H	
560	CO-NH-c-Pr	H	OH	OAc	H	H	
561	CO-NH-n-Pr	H	OH	OAc	H	H	
562	CO-NH-n-Bu	H	OH	OAc	H	H	
563	$CO-NMe_2$	H	OH	OAc	H	H	
564	$CO-NEt_2$	H	OH	OAc	H	H	
565	$CO-NHNH_2$	H	OH	OAc	H	H	
566	CN	H	OH	OAc	H	H	
567	CO-OH	H	OAc	OH	H	H	
568	CO-OMe	H	OAc	OAc	H	H	
569	CO-OEt	H	OAc	OAc	H	H	
570	CO-O-n-Pr	H	OAc	OAc	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
571	CO-O-n-Bu	H	OAc	OAc	H	H	
572	CO-O-c-Pr	H	OAc	OAc	H	H	
573	CO-O-CH_2CH_2OH	H	OAc	OAc	H	H	
574	CO-O-$C_{12}H_{25}$	H	OAc	OAc	H	H	
575	CO-O-$C_{16}H_{33}$	H	OAc	OAc	H	H	
576	CO-NH_2	H	OAc	OAc	H	H	
577	CO-NHMe	H	OAc	OAc	H	H	
578	CO-NHEt	H	OAc	OAc	H	H	
579	CO-NH-n-Pr	H	OAc	OAc	H	H	
580	CO-NH-i-Pr	H	OAc	OAc	H	H	
581	CO-NH-c-Pr	H	OAc	OAc	H	H	
582	CO-NH-n-Pr	H	OAc	OAc	H	H	
583	CO-NH-n-Bu	H	OAc	OAc	H	H	
584	CO-NMe_2	H	OAc	OAc	H	H	
585	CO-NEt_2	H	OAc	OAc	H	H	
586	CO-$NHNH_2$	H	OAc	OAc	H	H	
587	CN	H	OAc	OAc	H	H	
588	COOH	H	OH	OH	Me	H	
589	CO-OMe	H	OH	OH	Me	H	
590	CO-OEt	H	OH	OH	Me	H	
591	CO-O-n-Pr	H	OH	OH	Me	H	
592	CO-O-n-Bu	H	OH	OH	Me	H	
593	CO-O-c-Pr	H	OH	OH	Me	H	
594	CO-O-CH_2CH_2OH	H	OH	OH	Me	H	
595	CO-O-$C_{12}H_{25}$	H	OH	OH	Me	H	
596	CO-O-$C_{16}H_{33}$	H	OH	OH	Me	H	
597	CO-NH_2	H	OH	OH	Me	H	
598	CO-NHMe	H	OH	OH	Me	H	
599	CO-NHEt	H	OH	OH	Me	H	
600	CO-NH-n-Pr	H	OH	OH	Me	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
601	CO-NH-i-Pr	H	OH	OH	Me	H	
602	CO-NH-c-Pr	H	OH	OH	Me	H	
603	CO-NH-n-Pr	H	OH	OH	Me	H	
604	CO-NH-n-Bu	H	OH	OH	Me	H	
605	$CO\text{-}NMe_2$	H	OH	OH	Me	H	
606	$CO\text{-}NEt_2$	H	OH	OH	Me	H	
607	$CO\text{-}NHNH_2$	H	OH	OH	Me	H	
608	CN	H	OH	OH	Me	H	
609	CO-OH	H	OAc	OH	Me	H	
610	CO-OMe	H	OAc	OH	Me	H	
611	CO-OEt	H	OAc	OH	Me	H	
612	CO-O-n-Pr	H	OAc	OH	Me	H	
613	CO-O-n-Bu	H	OAc	OH	Me	H	
614	CO-O-c-Pr	H	OAc	OH	Me	H	
615	$CO\text{-}O\text{-}CH_2CH_2OH$	H	OAc	OH	Me	H	
616	$CO\text{-}O\text{-}C_{12}H_{25}$	H	OAc	OH	Me	H	
617	$CO\text{-}O\text{-}C_{16}H_{33}$	H	OAc	OH	Me	H	
618	$CO\text{-}NH_2$	H	OAc	OH	Me	H	
619	CO-NHMe	H	OAc	OH	Me	H	
620	CO-NHEt	H	OAc	OH	Me	H	
621	CO-NH-n-Pr	H	OAc	OH	Me	H	
622	CO-NH-i-Pr	H	OAc	OH	Me	H	
623	CO-NH-c-Pr	H	OAc	OH	Me	H	
624	CO-NH-n-Pr	H	OAc	OH	Me	H	
625	CO-NH-n-Bu	H	OAc	OH	Me	H	
626	$CO\text{-}NMe_2$	H	OAc	OH	Me	H	
627	$CO\text{-}NEt_2$	H	OAc	OH	Me	H	
628	$CO\text{-}NHNH_2$	H	OAc	OH	Me	H	
629	CN	H	OAc	OH	Me	H	
630	CO-OH	H	OAc	OAc	Me	H	
631	CO-OMe	H	OAc	OAc	Me	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
632	CO-OEt	H	OAc	OAc	Me	H	
633	CO-O-n-Pr	H	OAc	OAc	Me	H	
634	CO-O-n-Bu	H	OAc	OAc	Me	H	
635	CO-O-c-Pr	H	OAc	OAc	Me	H	
636	CO-O-CH_2CH_2OH	H	OAc	OAc	Me	H	
637	CO-O-$C_{12}H_{25}$	H	OAc	OAc	Me	H	
638	CO-O-$C_{16}H_{33}$	H	OAc	OAc	Me	H	
639	CO-NH_2	H	OAc	OAc	Me	H	
640	CO-NHMe	H	OAc	OAc	Me	H	
641	CO-NHEt	H	OAc	OAc	Me	H	
642	CO-NH-n-Pr	H	OAc	OAc	Me	H	
643	CO-NH-i-Pr	H	OAc	OAc	Me	H	
644	CO-NH-c-Pr	H	OAc	OAc	Me	H	
645	CO-NH-n-Pr	H	OAc	OAc	Me	H	
646	CO-NH-n-Bu	H	OAc	OAc	Me	H	
647	CO-NMe_2	H	OAc	OAc	Me	H	
648	CO-NEt_2	H	OAc	OAc	Me	H	
649	CO-$NHNH_2$	H	OAc	OAc	Me	H	
650	CN	H	OAc	OAc	Me	H	
651	CO-OH	H	OH	OAc	Me	H	
652	CO-OMe	H	OH	OAc	Me	H	
653	CO-OEt	H	OH	OAc	Me	H	
654	CO-O-n-Pr	H	OH	OAc	Me	H	
655	CO-O-n-Bu	H	OH	OAc	Me	H	
656	CO-O-c-Pr	H	OH	OAc	Me	H	
657	CO-O-CH_2CH_2OH	H	OH	OAc	Me	H	
658	CO-O-$C_{12}H_{25}$	H	OH	OAc	Me	H	
659	CO-O-$C_{16}H_{33}$	H	OH	OAc	Me	H	
660	CO-NH_2	H	OH	OAc	Me	H	
661	CO-NHMe	H	OH	OAc	Me	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
662	CO-NHEt	H	OH	OAc	Me	H	
663	CO-NH-n-Pr	H	OH	OAc	Me	H	
664	CO-NH-i-Pr	H	OH	OAc	Me	H	
665	CO-NH-c-Pr	H	OH	OAc	Me	H	
666	CO-NH-n-Pr	H	OH	OAc	Me	H	
667	CO-NH-n-Bu	H	OH	OAc	Me	H	
668	CO-NMe_2	H	OH	OAc	Me	H	
669	CO-NEt_2	H	OH	OAc	Me	H	
670	CO-$NHNH_2$	H	OH	OAc	Me	H	
671	CN	H	OAc	OAc	Me	H	
672	CO-OH	Me	OH	OH	H	H	
673	CO-OMe	Me	OH	OH	H	H	
674	CO-OEt	Me	OH	OH	H	H	
675	CO-O-n-Pr	Me	OH	OH	H	H	
676	CO-O-n-Bu	Me	OH	OH	H	H	
677	CO-O-c-Pr	Me	OH	OH	H	H	
678	CO-O-CH_2CH_2OH	Me	OH	OH	H	H	
679	CO-O-$C_{12}H_{25}$	Me	OH	OH	H	H	
680	CO-O-$C_{16}H_{33}$	Me	OH	OH	H	H	
681	CO-NH_2	Me	OH	OH	H	H	
682	CO-NHMe	Me	OH	OH	H	H	
683	CO-NHEt	Me	OH	OH	H	H	
684	CO-NH-n-Pr	Me	OH	OH	H	H	
685	CO-NH-i-Pr	Me	OH	OH	H	H	
686	CO-NH-c-Pr	Me	OH	OH	H	H	
687	CO-NH-n-Pr	Me	OH	OH	H	H	
688	CO-NH-n-Bu	Me	OH	OH	H	H	
689	CO-NMe_2	Me	OH	OH	H	H	
690	CO-NEt_2	Me	OH	OH	H	H	
691	CO-$NHNH_2$	Me	OH	OH	H	H	
692	CN	Me	OH	OH	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
693	CO-OH	Me	OAc	OH	H	H	
694	CO-OMe	Me	OAc	OH	H	H	
695	CO-OEt	Me	OAc	OH	H	H	
696	CO-O-n-Pr	Me	OAc	OH	H	H	
697	CO-O-n-Bu	Me	OAc	OH	H	H	
698	CO-O-c-Pr	Me	OAc	OH	H	H	
699	CO-O-CH_2CH_2OH	Me	OAc	OH	H	H	
700	CO-O-$C_{12}H_{25}$	Me	OAc	OH	H	H	
701	CO-O-$C_{16}H_{33}$	Me	OAc	OH	H	H	
702	CO-NH_2	Me	OAc	OH	H	H	
703	CO-NHMe	Me	OAc	OH	H	H	
704	CO-NHEt	Me	OAc	OH	H	H	
705	CO-NH-n-Pr	Me	OAc	OH	H	H	
706	CO-NH-i-Pr	Me	OAc	OH	H	H	
707	CO-NH-c-Pr	Me	OAc	OH	H	H	
708	CO-NH-n-Pr	Me	OAc	OH	H	H	
709	CO-NH-n-Bu	Me	OAc	OH	H	H	
710	CO-NMe_2	Me	OAc	OH	H	H	
711	CO-NEt_2	Me	OAc	OH	H	H	
712	CO-$NHNH_2$	Me	OAc	OH	H	H	
713	CN	Me	OAc	OH	H	H	
714	CO-OH	Me	OAc	OAc	H	H	
715	CO-OMe	Me	OAc	OAc	H	H	
716	CO-OEt	Me	OAc	OAc	H	H	
717	CO-O-n-Pr	Me	OAc	OAc	H	H	
718	CO-O-n-Bu	Me	OAc	OAc	H	H	
719	CO-O-c-Pr	Me	OAc	OAc	H	H	
720	CO-O-CH_2CH_2OH	Me	OAc	OAc	H	H	
721	CO-O-$C_{12}H_{25}$	Me	OAc	OAc	H	H	
722	CO-O-$C_{16}H_{33}$	Me	OAc	OAc	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
723	$CO\text{-}NH_2$	Me	OAc	OAc	H	H	
724	CO-NHMe	Me	OAc	OAc	H	H	
725	CO-NHEt	Me	OAc	OAc	H	H	
726	CO-NH-n-Pr	Me	OAc	OAc	H	H	
727	CO-NH-i-Pr	Me	OAc	OAc	H	H	
728	CO-NH-c-Pr	Me	OAc	OAc	H	H	
729	CO-NH-n-Pr	Me	OAc	OAc	H	H	
730	CO-NH-n-Bu	Me	OAc	OAc	H	H	
731	$CO\text{-}NMe_2$	Me	OAc	OAc	H	H	
732	$CO\text{-}NEt_2$	Me	OAc	OAc	H	H	
733	$CO\text{-}NHNH_2$	Me	OAc	OAc	H	H	
734	CN	Me	OAc	OAc	H	H	
735	CO-OH	Me	OH	OAc	H	H	
736	CO-OMe	Me	OH	OAc	H	H	
737	CO-OEt	Me	OH	OAc	H	H	
738	CO-O-n-Pr	Me	OH	OAc	H	H	
739	CO-O-n-Bu	Me	OH	OAc	H	H	
740	CO-O-c-Pr	Me	OH	OAc	H	H	
741	$CO\text{-}O\text{-}CH_2CH_2OH$	Me	OH	OAc	H	H	
742	$CO\text{-}O\text{-}C_{12}H_{25}$	Me	OH	OAc	H	H	
743	$CO\text{-}O\text{-}C_{16}H_{33}$	Me	OH	OAc	H	H	
744	$CO\text{-}NH_2$	Me	OH	OAc	H	H	
745	CO-NHMe	Me	OH	OAc	H	H	
746	CO-NHEt	Me	OH	OAc	H	H	
747	CO-NH-n-Pr	Me	OH	OAc	H	H	
748	CO-NH-i-Pr	Me	OH	OAc	H	H	
749	CO-NH-c-Pr	Me	OH	OAc	H	H	
750	CO-NH-n-Pr	Me	OH	OAc	H	H	
751	CO-NH-n-Bu	Me	OH	OAc	H	H	
752	$CO\text{-}NMe_2$	Me	OH	OAc	H	H	
753	$CO\text{-}NEt_2$	Me	OH	OAc	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
754	CO-$NHNH_2$	H	OH	OAc	H	H	
755	CN	Me	OAc	OAc	H	H	
756	CO-OH	H	OH	OH	H	Me	
757	CO-OMe	H	OH	OH	H	Me	
758	CO-OEt	H	OH	OH	H	Me	
759	CO-O-n-Pr	H	OH	OH	H	Me	
760	CO-O-n-Bu	H	OH	OH	H	Me	
761	CO-O-c-Pr	H	OH	OH	H	Me	
762	CO-O-CH_2CH_2OH	H	OH	OH	H	Me	
763	CO-O-$C_{12}H_{25}$	H	OH	OH	H	Me	
764	CO-O-$C_{16}H_{33}$	H	OH	OH	H	Me	
765	CO-NH_2	H	OH	OH	H	Me	
766	CO-NHMe	H	OH	OH	H	Me	
767	CO-NHEt	H	OH	OH	H	Me	
768	CO-NH-n-Pr	H	OH	OH	H	Me	
769	CO-NH-i-Pr	H	OH	OH	H	Me	
770	CO-NH-c-Pr	H	OH	OH	H	Me	
771	CO-NH-n-Pr	H	OH	OH	H	Me	
772	CO-NH-n-Bu	H	OH	OH	H	Me	
773	CO-NMe_2	H	OH	OH	H	Me	
774	CO-NEt_2	H	OH	OH	H	Me	
775	CO-$NHNH_2$	H	OH	OH	H	Me	
776	CN	H	OH	OH	H	Me	
777	CO-OH	H	OAc	OH	H	Me	
778	CO-OMe	H	OAc	OH	H	Me	
779	CO-OEt	H	OAc	OH	H	Me	
780	CO-O-n-Pr	H	OAc	OH	H	Me	
781	CO-O-n-Bu	H	OAc	OH	H	Me	
782	CO-O-c-Pr	H	OAc	OH	H	Me	
783	CO-O-CH_2CH_2OH	H	OAc	OH	H	Me	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
784	CO-O-$C_{12}H_{25}$	H	OAc	OH	H	Me	
785	CO-O-$C_{16}H_{33}$	H	OAc	OH	H	Me	
786	CO-NH_2	H	OAc	OH	H	Me	
787	CO-NHMe	H	OAc	OH	H	Me	
788	CO-NHEt	H	OAc	OH	H	Me	
789	CO-NH-n-Pr	H	OAc	OH	H	Me	
790	CO-NH-i-Pr	H	OAc	OH	H	Me	
791	CO-NH-c-Pr	H	OAc	OH	H	Me	
792	CO-NH-n-Pr	H	OAc	OH	H	Me	
793	CO-NH-n-Bu	H	OAc	OH	H	Me	
794	CO-NMe_2	H	OAc	OH	H	Me	
795	CO-NEt_2	H	OAc	OH	H	Me	
796	CO-$NHNH_2$	H	OAc	OH	H	Me	
797	CN	H	OAc	OH	H	Me	
798	CO-OH	H	OAc	OAc	H	Me	
799	CO-OMe	H	OAc	OAc	H	Me	
800	CO-OEt	H	OAc	OAc	H	Me	
801	CO-O-n-Pr	H	OAc	OAc	H	Me	
802	CO-O-n-Bu	H	OAc	OAc	H	Me	
803	CO-O-c-Pr	H	OAc	OAc	H	Me	
804	CO-O-CH_2CH_2OH	H	OAc	OAc	H	Me	
805	CO-O-$C_{12}H_{25}$	H	OAc	OAc	H	Me	
806	CO-O-$C_{16}H_{33}$	H	OAc	OAc	H	Me	
807	CO-NH_2	H	OAc	OAc	H	Me	
808	CO-NHMe	H	OAc	OAc	H	Me	
809	CO-NHEt	H	OAc	OAc	H	Me	
810	CO-NH-n-Pr	H	OAc	OAc	H	Me	
811	CO-NH-i-Pr	H	OAc	OAc	H	Me	
812	CO-NH-c-Pr	H	OAc	OAc	H	Me	
813	CO-NH-n-Pr	H	OAc	OAc	H	Me	
814	CO-NH-n-Bu	H	OAc	OAc	H	Me	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
815	CO-NMe_2	H	OAc	OAc	H	Me	
816	CO-NEt_2	H	OAc	OAc	H	Me	
817	CO-$NHNH_2$	H	OAc	OAc	H	Me	
818	CN	H	OAc	OAc	H	Me	
819	CO-OH	H	OH	OAc	H	Me	
820	CO-OMe	H	OH	OAc	H	Me	
821	CO-OEt	H	OH	OAc	H	Me	
822	CO-O-n-Pr	H	OH	OAc	H	Me	
823	CO-O-n-Bu	H	OH	OAc	H	Me	
824	CO-O-c-Pr	H	OH	OAc	H	Me	
825	CO-O-CH_2CH_2OH	H	OH	OAc	H	Me	
826	CO-O-$C_{12}H_{25}$	H	OH	OAc	H	Me	
827	CO-O-$C_{16}H_{33}$	H	OH	OAc	H	Me	
828	CO-NH_2	H	OH	OAc	H	Me	
829	CO-NHMe	H	OH	OAc	H	Me	
830	CO-NHEt	H	OH	OAc	H	Me	
831	CO-NH-n-Pr	H	OH	OAc	H	Me	
832	CO-NH-i-Pr	H	OH	OAc	H	Me	
833	CO-NH-c-Pr	H	OH	OAc	H	Me	
834	CO-NH-n-Pr	H	OH	OAc	H	Me	
835	CO-NH-n-Bu	H	OH	OAc	H	Me	
836	CO-NMe_2	H	OH	OAc	H	Me	
837	CO-NEt_2	H	OH	OAc	H	Me	
838	CO-$NHNH_2$	H	OH	OAc	H	Me	
839	CN	H	OAc	OAc	H	Me	
840	CO-OH	H	OH	OMe	H	H	
841	CO-OMe	H	OH	OMe	H	H	
842	CO-OEt	H	OH	OMe	H	H	
843	CO-O-n-Pr	H	OH	OMe	H	H	
844	CO-O-n-Bu	H	OH	OMe	H	H	
845	CO-O-c-Pr	H	OH	OMe	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
846	CO-O-CH_2CH_2OH	H	OH	OMe	H	H	
847	CO-O-$C_{12}H_{25}$	H	OH	OMe	H	H	
848	CO-O-$C_{16}H_{33}$	H	OH	OMe	H	H	
849	CO-NH_2	H	OH	OMe	H	H	
850	CO-NHMe	H	OH	OMe	H	H	
851	CO-NHEt	H	OH	OMe	H	H	
852	CO-NH-n-Pr	H	OH	OMe	H	H	
853	CO-NH-i-Pr	H	OH	OMe	H	H	
854	CO-NH-c-Pr	H	OH	OMe	H	H	
855	CO-NH-n-Pr	H	OH	OMe	H	H	
856	CO-NH-n-Bu	H	OH	OMe	H	H	
857	CO-NMe_2	H	OH	OMe	H	H	
858	CO-NEt_2	H	OH	OMe	H	H	
859	CO-$NHNH_2$	H	OH	OMe	H	H	
860	CN	H	OH	OMe	H	H	
861	CO-OH	H	OAc	OMe	H	H	
862	CO-OMe	H	OAc	OMe	H	H	
863	CO-OEt	H	OAc	OMe	H	H	
864	CO-O-n-Pr	H	OAc	OMe	H	H	
865	CO-O-n-Bu	H	OAc	OMe	H	H	
866	CO-O-c-Pr	H	OAc	OMe	H	H	
867	CO-O-CH_2CH_2OH	H	OAc	OMe	H	H	
868	CO-O-$C_{12}H_{25}$	H	OAc	OMe	H	H	
869	CO-O-$C_{16}H_{33}$	H	OAc	OMe	H	H	
870	CO-NH_2	H	OAc	OMe	H	H	
871	CO-NHMe	H	OAc	OMe	H	H	
872	CO-NHEt	H	OAc	OMe	H	H	
873	CO-NH-n-Pr	H	OAc	OMe	H	H	
874	CO-NH-i-Pr	H	OAc	OMe	H	H	
875	CO-NH-c-Pr	H	OAc	OMe	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
876	CO-NH-n-Pr	H	OAc	OMe	H	H	
877	CO-NH-n-Bu	H	OAc	OMe	H	H	
878	$CO-NMe_2$	H	OAc	OMe	H	H	
879	$CO-NEt_2$	H	OAc	OMe	H	H	
880	$CO-NHNH_2$	H	OAc	OMe	H	H	
881	CN	H	OAc	OMe	H	H	
882	CO-OH	H	OMe	OH	H	H	
883	CO-OMe	H	OMe	OH	H	H	
884	CO-OEt	H	OMe	OH	H	H	
885	CO-O-n-Pr	H	OMe	OH	H	H	
886	CO-O-n-Bu	H	OMe	OH	H	H	
887	CO-O-c-Pr	H	OMe	OH	H	H	
888	$CO-O-CH_2CH_2OH$	H	OMe	OH	H	H	
889	$CO-O-C_{12}H_{25}$	H	OMe	OH	H	H	
890	$CO-O-C_{16}H_{33}$	H	OMe	OH	H	H	
891	$CO-NH_2$	H	OMe	OH	H	H	
892	CO-NHMe	H	OMe	OH	H	H	
893	CO-NHEt	H	OMe	OH	H	H	
894	CO-NH-n-Pr	H	OMe	OH	H	H	
895	CO-NH-i-Pr	H	OMe	OH	H	H	
896	CO-NH-c-Pr	H	OMe	OH	H	H	
897	CO-NH-n-Pr	H	OMe	OH	H	H	
898	CO-NH-n-Bu	H	OMe	OH	H	H	
899	$CO-NMe_2$	H	OMe	OH	H	H	
900	$CO-NEt_2$	H	OMe	OH	H	H	
901	$CO-NHNH_2$	H	OMe	OH	H	H	
902	CN	H	OMe	OH	H	H	
903	CO-OH	H	OMe	OAc	H	H	
904	CO-OMe	H	OMe	OAc	H	H	
905	CO-OEt	H	OMe	OAc	H	H	
906	CO-O-n-Pr	H	OMe	OAc	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
907	CO-O-n-Bu	H	OMe	OAc	H	H	
908	CO-O-c-Pr	H	OMe	OAc	H	H	
909	CO-O-CH_2CH_2OH	H	OMe	OAc	H	H	
910	CO-O-$C_{12}H_{25}$	H	OMe	OAc	H	H	
911	CO-O-$C_{16}H_{33}$	H	OMe	OAc	H	H	
912	CO-NH_2	H	OMe	OAc	H	H	
913	CO-NHMe	H	OMe	OAc	H	H	
914	CO-NHEt	H	OMe	OAc	H	H	
915	CO-NH-n-Pr	H	OMe	OAc	H	H	
916	CO-NH-i-Pr	H	OMe	OAc	H	H	
917	CO-NH-c-Pr	H	OMe	OAc	H	H	
918	CO-NH-n-Pr	H	OMe	OAc	H	H	
919	CO-NH-n-Bu	H	OMe	OAc	H	H	
920	CO-NMe_2	H	OMe	OAc	H	H	
921	CO-NEt_2	H	OMe	OAc	H	H	
922	CO-$NHNH_2$	H	OMe	OAc	H	H	
923	CN	H	OMe	OAc	H	H	
924	CO-OH	H	NH_2	OH	H	H	
925	CO-OMe	H	NH_2	OH	H	H	
926	CO-OEt	H	NH_2	OH	H	H	
927	CO-O-n-Pr	H	NH_2	OH	H	H	
928	CO-O-n-Bu	H	NH_2	OH	H	H	
929	CO-O-c-Pr	H	NH_2	OH	H	H	
930	CO-O-CH_2CH_2OH	H	NH_2	OH	H	H	
931	CO-O-$C_{12}H_{25}$	H	NH_2	OH	H	H	
932	CO-O-$C_{16}H_{33}$	H	NH_2	OH	H	H	
933	CO-NH_2	H	NH_2	OH	H	H	
934	CO-NHMe	H	NH_2	OH	H	H	
935	CO-NHEt	H	NH_2	OH	H	H	
936	CO-NH-n-Pr	H	NH_2	OH	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
937	CO-NH-i-Pr	H	NH_2	OH	H	H	
938	CO-NH-c-Pr	H	NH_2	OH	H	H	
939	CO-NH-n-Pr	H	NH_2	OH	H	H	
940	CO-NH-n-Bu	H	NH_2	OH	H	H	
941	CO-NMe_2	H	NH_2	OH	H	H	
942	CO-NEt_2	H	NH_2	OH	H	H	
943	CO-$NHNH_2$	H	NH_2	OH	H	H	
944	CN	H	NH_2	OH	H	H	
945	CO-OH	H	NH_2	OAc	H	H	
946	CO-OMe	H	NH_2	OAc	H	H	
947	CO-OEt	H	NH_2	OAc	H	H	
948	CO-O-n-Pr	H	NH_2	OAc	H	H	
949	CO-O-n-Bu	H	NH_2	OAc	H	H	
950	CO-O-c-Pr	H	NH_2	OAc	H	H	
951	CO-O-CH_2CH_2OH	H	NH_2	OAc	H	H	
952	CO-O-$C_{12}H_{25}$	H	NH_2	OAc	H	H	
953	CO-O-$C_{16}H_{33}$	H	NH_2	OAc	H	H	
954	CO-NH_2	H	NH_2	OAc	H	H	
955	CO-NHMe	H	NH_2	OAc	H	H	
956	CO-NHEt	H	NH_2	OAc	H	H	
957	CO-NH-n-Pr	H	NH_2	OAc	H	H	
958	CO-NH-i-Pr	H	NH_2	OAc	H	H	
959	CO-NH-c-Pr	H	NH_2	OAc	H	H	
960	CO-NH-n-Pr	H	NH_2	OAc	H	H	
961	CO-NH-n-Bu	H	NH_2	OAc	H	H	
962	CO-NMe_2	H	NH_2	OAc	H	H	
963	CO-NEt_2	H	NH_2	OAc	H	H	
964	CO-$NHNH_2$	H	NH_2	OAc	H	H	
965	CN	H	NH_2	OAc	H	H	
966	CO-OH	H	OH	NH_2	H	H	
967	CO-OMe	H	OH	NH_2	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
968	CO-OEt	H	OH	NH_2	H	H	
969	CO-O-n-Pr	H	OH	NH_2	H	H	
970	CO-O-n-Bu	H	OH	NH_2	H	H	
971	CO-O-c-Pr	H	OH	NH_2	H	H	
972	CO-O-CH_2CH_2OH	H	OH	NH_2	H	H	
973	CO-O-$C_{12}H_{25}$	H	OH	NH_2	H	H	
974	CO-O-$C_{16}H_{33}$	H	OH	NH_2	H	H	
975	CO-NH_2	H	OH	NH_2	H	H	
976	CO-NHMe	H	OH	NH_2	H	H	
977	CO-NHEt	H	OH	NH_2	H	H	
978	CO-NH-n-Pr	H	OH	NH_2	H	H	
979	CO-NH-i-Pr	H	OH	NH_2	H	H	
980	CO-NH-c-Pr	H	OH	NH_2	H	H	
981	CO-NH-n-Pr	H	OH	NH_2	H	H	
982	CO-NH-n-Bu	H	OH	NH_2	H	H	
983	CO-NMe_2	H	OH	NH_2	H	H	
984	CO-NEt_2	H	OH	NH_2	H	H	
985	CO-$NHNH_2$	H	OH	NH_2	H	H	
986	CN	H	OH	NH_2	H	H	
987	CO-OH	H	OAc	NH_2	H	H	
988	CO-OMe	H	OAc	NH_2	H	H	
989	CO-OEt	H	OAc	NH_2	H	H	
990	CO-O-n-Pr	H	OAc	NH_2	H	H	
991	CO-O-n-Bu	H	OAc	NH_2	H	H	
992	CO-O-c-Pr	H	OAc	NH_2	H	H	
993	CO-O-CH_2CH_2OH	H	OAc	NH_2	H	H	
994	CO-O-$C_{12}H_{25}$	H	OAc	NH_2	H	H	
995	CO-O-$C_{16}H_{33}$	H	OAc	NH_2	H	H	
996	CO-NH_2	H	OAc	NH_2	H	H	
997	CO-NHMe	H	OAc	NH_2	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
998	CO-NHEt	H	OAc	NH_2	H	H	
999	CO-NH-n-Pr	H	OAc	NH_2	H	H	
1000	CO-NH-i-Pr	H	OAc	NH_2	H	H	
1001	CO-NH-c-Pr	H	OAc	NH_2	H	H	
1002	CO-NH-n-Pr	H	OAc	NH_2	H	H	
1003	CO-NH-n-Bu	H	OAc	NH_2	H	H	
1004	CO-NMe_2	H	OAc	NH_2	H	H	
1005	CO-NEt_2	H	OAc	NH_2	H	H	
1006	CO-$NHNH_2$	H	OAc	NH_2	H	H	
1007	CN	H	OAc	NH_2	H	H	
1008	CO-OH	H	NH_2	OMe	H	H	
1009	CO-OMe	H	NH_2	OMe	H	H	
1010	CO-OEt	H	NH_2	OMe	H	H	
1011	CO-O-n-Pr	H	NH_2	OMe	H	H	
1012	CO-O-n-Bu	H	NH_2	OMe	H	H	
1013	CO-O-c-Pr	H	NH_2	OMe	H	H	
1014	CO-O-CH_2CH_2OH	H	NH_2	OMe	H	H	
1015	CO-O-$C_{12}H_{25}$	H	NH_2	OMe	H	H	
1016	CO-O-$C_{16}H_{33}$	H	NH_2	OMe	H	H	
1017	CO-NH_2	H	NH_2	OMe	H	H	
1018	CO-NHMe	H	NH_2	OMe	H	H	
1019	CO-NHEt	H	NH_2	OMe	H	H	
1020	CO-NH-n-Pr	H	NH_2	OMe	H	H	
1021	CO-NH-i-Pr	H	NH_2	OMe	H	H	
1022	CO-NH-c-Pr	H	NH_2	OMe	H	H	
1023	CO-NH-n-Pr	H	NH_2	OMe	H	H	
1024	CO-NH-n-Bu	H	NH_2	OMe	H	H	
1025	CO-NMe_2	H	NH_2	OMe	H	H	
1026	CO-NEt_2	H	NH_2	OMe	H	H	
1027	CO-$NHNH_2$	H	NH_2	OMe	H	H	
1028	CN	H	NH_2	OMe	H	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1029	CO-OH	H	OMe	NH_2	H	H	
1030	CO-OMe	H	OMe	NH_2	H	H	
1031	CO-OEt	H	OMe	NH_2	H	H	
1032	CO-O-n-Pr	H	OMe	NH_2	H	H	
1033	CO-O-n-Bu	H	OMe	NH_2	H	H	
1034	CO-O-c-Pr	H	OMe	NH_2	H	H	
1035	CO-O-CH_2CH_2OH	H	OMe	NH_2	H	H	
1036	CO-O-$C_{12}H_{25}$	H	OMe	NH_2	H	H	
1037	CO-O-$C_{16}H_{33}$	H	OMe	NH_2	H	H	
1038	CO-NH_2	H	OMe	NH_2	H	H	
1039	CO-NHMe	H	OMe	NH_2	H	H	
1040	CO-NHEt	H	OMe	NH_2	H	H	
1041	CO-NH-n-Pr	H	OMe	NH_2	H	H	
1042	CO-NH-i-Pr	H	OMe	NH_2	H	H	
1043	CO-NH-c-Pr	H	OMe	NH_2	H	H	
1044	CO-NH-n-Pr	H	OMe	NH_2	H	H	
1045	CO-NH-n-Bu	H	OMe	NH_2	H	H	
1046	CO-NMe_2	H	OMe	NH_2	H	H	
1047	CO-NEt_2	H	OMe	NH_2	H	H	
1048	CO-$NHNH_2$	H	OMe	NH_2	H	H	
1049	CN	H	OMe	NH_2	H	H	
1050	CO-OH	H	OH	H	OH	H	
1051	CO-OMe	H	OH	H	OH	H	
1052	CO-OEt	H	OH	H	OH	H	
1053	CO-O-n-Pr	H	OH	H	OH	H	
1054	CO-O-n-Bu	H	OH	H	OH	H	
1055	CO-O-c-Pr	H	OH	H	OH	H	
1056	CO-O-CH_2CH_2OH	H	OH	H	OH	H	
1057	CO-O-$C_{12}H_{25}$	H	OH	H	OH	H	
1058	CO-O-$C_{16}H_{33}$	H	OH	H	OH	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1059	CO-NH_2	H	OH	H	OH	H	
1060	CO-NHMe	H	OH	H	OH	H	
1061	CO-NHEt	H	OH	H	OH	H	
1062	CO-NH-n-Pr	H	OH	H	OH	H	
1063	CO-NH-i-Pr	H	OH	H	OH	H	
1064	CO-NH-c-Pr	H	OH	H	OH	H	
1065	CO-NH-n-Pr	H	OH	H	OH	H	
1066	CO-NH-n-Bu	H	OH	H	OH	H	
1067	CO-NMe_2	H	OH	H	OH	H	
1068	CO-NEt_2	H	OH	H	OH	H	
1069	CO-$NHNH_2$	H	OH	H	OH	H	
1070	CN	H	OH	H	OH	H	
1071	CO-OH	H	OAc	H	OAc	H	
1072	CO-OMe	H	OAc	H	OAc	H	
1073	CO-OEt	H	OAc	H	OAc	H	
1074	CO-O-n-Pr	H	OAc	H	OAc	H	
1075	CO-O-n-Bu	H	OAc	H	OAc	H	
1076	CO-O-c-Pr	H	OAc	H	OAc	H	
1077	CO-O-CH_2CH_2OH	H	OAc	H	OAc	H	
1078	CO-O-$C_{12}H_{25}$	H	OAc	H	OAc	H	
1079	CO-O-$C_{16}H_{33}$	H	OAc	H	OAc	H	
1080	CO-NH_2	H	OAc	H	OAc	H	
1081	CO-NHMe	H	OAc	H	OAc	H	
1082	CO-NHEt	H	OAc	H	OAc	H	
1083	CO-NH-n-Pr	H	OAc	H	OAc	H	
1084	CO-NH-i-Pr	H	OAc	H	OAc	H	
1085	CO-NH-c-Pr	H	OAc	H	OAc	H	
1086	CO-NH-n-Pr	H	OAc	H	OAc	H	
1087	CO-NH-n-Bu	H	OAc	H	OAc	H	
1088	CO-NMe_2	H	OAc	H	OAc	H	
1089	CO-NEt_2	H	OAc	H	OAc	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1090	CO-$NHNH_2$	H	OAc	H	OAc	H	
1091	CN	H	OAc	H	OAc	H	
1092	CO-OH	H	OH	H	OAc	H	
1093	CO-OMe	H	OH	H	OAc	H	
1094	CO-OEt	H	OH	H	OAc	H	
1095	CO-O-n-Pr	H	OH	H	OAc	H	
1096	CO-O-n-Bu	H	OH	H	OAc	H	
1097	CO-O-c-Pr	H	OH	H	OAc	H	
1098	CO-O-CH_2CH_2OH	H	OH	H	OAc	H	
1099	CO-O-$C_{12}H_{25}$	H	OH	H	OAc	H	
1100	CO-O-$C_{16}H_{33}$	H	OH	H	OAc	H	
1101	CO-NH_2	H	OH	H	OAc	H	
1102	CO-NHMe	H	OH	H	OAc	H	
1103	CO-NHEt	H	OH	H	OAc	H	
1104	CO-NH-n-Pr	H	OH	H	OAc	H	
1105	CO-NH-i-Pr	H	OH	H	OAc	H	
1106	CO-NH-c-Pr	H	OH	H	OAc	H	
1107	CO-NH-n-Pr	H	OH	H	OAc	H	
1108	CO-NH-n-Bu	H	OH	H	OAc	H	
1109	CO-NMe_2	H	OH	H	OAc	H	
1110	CO-NEt_2	H	OH	H	OAc	H	
1111	CO-$NHNH_2$	H	OH	H	OAc	H	
1112	CN	H	OH	H	OAc	H	
1113	CO-OH	H	OH	OH	OH	H	
1114	CO-OMe	H	OH	OH	OH	H	
1115	CO-OEt	H	OH	OH	OH	H	
1116	CO-O-n-Pr	H	OH	OH	OH	H	
1117	CO-O-n-Bu	H	OH	OH	OH	H	
1118	CO-O-i-Pen	H	OH	OH	OH	H	
1119	CO-O-c-Pr	H	OH	OH	OH	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1120	CO-O-CH_2CH_2OH	H	OH	OH	OH	H	
1121	CO-O-C_8H_{17}	H	OH	OH	OH	H	
1122	CO-O-$C_{12}H_{25}$	H	OH	OH	OH	H	
1123	CO-O-$C_{16}H_{33}$	H	OH	OH	OH	H	
1124	CO-NH_2	H	OH	OH	OH	H	
1125	CO-NHMe	H	OH	OH	OH	H	
1126	CO-NHEt	H	OH	OH	OH	H	
1127	CO-NH-n-Pr	H	OH	OH	OH	H	
1128	CO-NH-i-Pr	H	OH	OH	OH	H	
1129	CO-NH-c-Pr	H	OH	OH	OH	H	
1130	CO-NH-n-Pr	H	OH	OH	OH	H	
1131	CO-NH-n-Bu	H	OH	OH	OH	H	
1132	CO-NMe_2	H	OH	OH	OH	H	
1133	CO-NEt_2	H	OH	OH	OH	H	
1134	CO-$NHNH_2$	H	OH	OH	OH	H	
1135	CN	H	OH	OH	OH	H	
1136	CO-OH	H	OAc	OH	OH	H	
1137	CO-OMe	H	OAc	OH	OH	H	
1138	CO-OEt	H	OAc	OH	OH	H	
1139	CO-O-n-Pr	H	OAc	OH	OH	H	
1140	CO-O-n-Bu	H	OAc	OH	OH	H	
1141	CO-O-c-Pr	H	OAc	OH	OH	H	
1142	CO-O-CH_2CH_2OH	H	OAc	OH	OH	H	
1143	CO-O-$C_{12}H_{25}$	H	OAc	OH	OH	H	
1144	CO-O-$C_{16}H_{33}$	H	OAc	OH	OH	H	
1145	CO-NH_2	H	OAc	OH	OH	H	
1146	CO-NHMe	H	OAc	OH	OH	H	
1147	CO-NHEt	H	OAc	OH	OH	H	
1148	CO-NH-n-Pr	H	OAc	OH	OH	H	
1149	CO-NH-i-Pr	H	OAc	OH	OH	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1150	CO-NH-c-Pr	H	OAc	OH	OH	H	
1151	CO-NH-n-Pr	H	OAc	OH	OH	H	
1152	CO-NH-n-Bu	H	OAc	OH	OH	H	
1153	$CO-NMe_2$	H	OAc	OH	OH	H	
1154	$CO-NEt_2$	H	OAc	OH	OH	H	
1155	$CO-NHNH_2$	H	OAc	OH	OH	H	
1156	CN	H	OAc	OH	OH	H	
1157	CO-OH	H	OH	OAc	OH	H	
1158	CO-OMe	H	OH	OAc	OH	H	
1159	CO-OEt	H	OH	OAc	OH	H	
1160	CO-O-n-Pr	H	OH	OAc	OH	H	
1161	CO-O-n-Bu	H	OH	OAc	OH	H	
1162	CO-O-i-Pen	H	OH	OAc	OH	H	
1163	CO-O-c-Pr	H	OH	OAc	OH	H	
1164	$CO-O-CH_2CH_2OH$	H	OH	OAc	OH	H	
1165	$CO-O-C_8H_{17}$	H	OH	OAc	OH	H	
1166	$CO-O-C_{12}H_{25}$	H	OH	OAc	OH	H	
1167	$CO-O-C_{16}H_{33}$	H	OH	OAc	OH	H	
1168	$CO-NH_2$	H	OH	OAc	OH	H	
1169	CO-NHMe	H	OH	OAc	OH	H	
1170	CO-NHEt	H	OH	OAc	OH	H	
1171	CO-NH-n-Pr	H	OH	OAc	OH	H	
1172	CO-NH-i-Pr	H	OH	OAc	OH	H	
1173	CO-NH-c-Pr	H	OH	OAc	OH	H	
1174	CO-NH-n-Pr	H	OH	OAc	OH	H	
1175	CO-NH-n-Bu	H	OH	OAc	OH	H	
1176	$CO-NMe_2$	H	OH	OAc	OH	H	
1177	$CO-NEt_2$	H	OH	OAc	OH	H	
1178	$CO-NHNH_2$	H	OH	OAc	OH	H	
1179	CN	H	OH	OAc	OH	H	
1180	CO-OH	H	OAc	OAc	OH	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1181	CO-OMe	H	OAc	OAc	OH	H	
1182	CO-OEt	H	OAc	OAc	OH	H	
1183	CO-O-n-Pr	H	OAc	OAc	OH	H	
1184	CO-O-n-Bu	H	OAc	OAc	OH	H	
1185	CO-O-i-Pen	H	OAc	OAc	OH	H	
1186	CO-O-c-Pr	H	OAc	OAc	OH	H	
1187	CO-O-CH_2CH_2OH	H	OAc	OAc	OH	H	
1188	CO-O-C_8H_{17}	H	OAc	OAc	OH	H	
1189	CO-O-$C_{12}H_{25}$	H	OAc	OAc	OH	H	
1190	CO-O-$C_{16}H_{33}$	H	OAc	OAc	OH	H	
1191	CO-NH_2	H	OAc	OAc	OH	H	
1192	CO-NHMe	H	OAc	OAc	OH	H	
1193	CO-NHEt	H	OAc	OAc	OH	H	
1194	CO-NH-n-Pr	H	OAc	OAc	OH	H	
1195	CO-NH-i-Pr	H	OAc	OAc	OH	H	
1196	CO-NH-c-Pr	H	OAc	OAc	OH	H	
1197	CO-NH-n-Pr	H	OAc	OAc	OH	H	
1198	CO-NH-n-Bu	H	OAc	OAc	OH	H	
1199	CO-NMe_2	H	OAc	OAc	OH	H	
1200	CO-NEt_2	H	OAc	OAc	OH	H	
1201	CO-$NHNH_2$	H	OAc	OAc	OH	H	
1202	CN	H	OAc	OAc	OH	H	
1203	CO-OH	H	OAc	OAc	OAc	H	
1204	CO-OMe	H	OAc	OAc	OAc	H	
1205	CO-OEt	H	OAc	OAc	OAc	H	
1206	CO-O-n-Pr	H	OAc	OAc	OAc	H	
1207	CO-O-n-Bu	H	OAc	OAc	OAc	H	
1208	CO-O-i-Pen	H	OAc	OAc	OAc	H	
1209	CO-O-c-Pr	H	OAc	OAc	OAc	H	
1210	CO-O-CH_2CH_2OH	H	OAc	OAc	OAc	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1211	CO-O-C_8H_{17}	H	OAc	OAc	OAc	H	
1212	CO-O-$C_{12}H_{25}$	H	OAc	OAc	OAc	H	
1213	CO-O-$C_{16}H_{33}$	H	OAc	OAc	OAc	H	
1214	CO-NH_2	H	OAc	OAc	OAc	H	
1215	CO-NHMe	H	OAc	OAc	OAc	H	
1216	CO-NHEt	H	OAc	OAc	OAc	H	
1217	CO-NH-n-Pr	H	OAc	OAc	OAc	H	
1218	CO-NH-i-Pr	H	OAc	OAc	OAc	H	
1219	CO-NH-c-Pr	H	OAc	OAc	OAc	H	
1220	CO-NH-n-Pr	H	OAc	OAc	OAc	H	
1221	CO-NH-n-Bu	H	OAc	OAc	OAc	H	
1222	CO-NMe_2	H	OAc	OAc	OAc	H	
1223	CO-NEt_2	H	OAc	OAc	OAc	H	
1224	CO-$NHNH_2$	H	OAc	OAc	OAc	H	
1225	CN	H	OAc	OAc	OAc	H	
1226	CO-OH	H	OMe	OH	OH	H	
1227	CO-OMe	H	OMe	OH	OH	H	
1228	CO-OEt	H	OMe	OH	OH	H	
1229	CO-O-n-Pr	H	OMe	OH	OH	H	
1230	CO-O-n-Bu	H	OMe	OH	OH	H	
1231	CO-O-i-Pen	H	OMe	OH	OH	H	
1232	CO-O-c-Pr	H	OMe	OH	OH	H	
1233	CO-O-CH_2CH_2OH	H	OMe	OH	OH	H	
1234	CO-O-C_8H_{17}	H	OMe	OH	OH	H	
1235	CO-O-$C_{12}H_{25}$	H	OMe	OH	OH	H	
1236	CO-O-$C_{16}H_{33}$	H	OMe	OH	OH	H	
1237	CO-NH_2	H	OMe	OH	OH	H	
1238	CO-NHMe	H	OMe	OH	OH	H	
1239	CO-NHEt	H	OMe	OH	OH	H	
1240	CO-NH-n-Pr	H	OMe	OH	OH	H	
1241	CO-NH-i-Pr	H	OMe	OH	OH	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1242	CO-NH-c-Pr	H	OMe	OH	OH	H	
1243	CO-NH-n-Pr	H	OMe	OH	OH	H	
1244	CO-NH-n-Bu	H	OMe	OH	OH	H	
1245	$CO\text{-}NMe_2$	H	OMe	OH	OH	H	
1246	$CO\text{-}NEt_2$	H	OMe	OH	OH	H	
1247	$CO\text{-}NHNH_2$	H	OMe	OH	OH	H	
1248	CN	H	OMe	OH	OH	H	
1249	CO-OH	H	OH	OMe	OH	H	
1250	CO-OMe	H	OH	OMe	OH	H	
1251	CO-OEt	H	OH	OMe	OH	H	
1252	CO-O-n-Pr	H	OH	OMe	OH	H	
1253	CO-O-n-Bu	H	OH	OMe	OH	H	
1254	CO-O-i-Pen	H	OH	OMe	OH	H	
1255	CO-O-c-Pr	H	OH	OMe	OH	H	
1256	$CO\text{-}O\text{-}CH_2CH_2OH$	H	OH	OMe	OH	H	
1257	$CO\text{-}O\text{-}C_8H_{17}$	H	OH	OMe	OH	H	
1258	$CO\text{-}O\text{-}C_{12}H_{25}$	H	OH	OMe	OH	H	
1259	$CO\text{-}O\text{-}C_{16}H_{33}$	H	OH	OMe	OH	H	
1260	$CO\text{-}NH_2$	H	OH	OMe	OH	H	
1261	CO-NHMe	H	OH	OMe	OH	H	
1262	CO-NHEt	H	OH	OMe	OH	H	
1263	CO-NH-n-Pr	H	OH	OMe	OH	H	
1264	CO-NH-i-Pr	H	OH	OMe	OH	H	
1265	CO-NH-c-Pr	H	OH	OMe	OH	H	
1266	CO-NH-n-Pr	H	OH	OMe	OH	H	
1267	CO-NH-n-Bu	H	OH	OMe	OH	H	
1268	$CO\text{-}NMe_2$	H	OH	OMe	OH	H	
1269	$CO\text{-}NEt_2$	H	OH	OMe	OH	H	
1270	$CO\text{-}NHNH_2$	H	OH	OMe	OH	H	
1271	CN	H	OH	OMe	OH	H	
1272	CO-OH	H	OMe	OH	OMe	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1273	CO-OMe	H	OMe	OH	OMe	H	
1274	CO-OEt	H	OMe	OH	OMe	H	
1275	CO-O-n-Pr	H	OMe	OH	OMe	H	
1276	CO-O-n-Bu	H	OMe	OH	OMe	H	
1277	CO-O-i-Pen	H	OMe	OH	OMe	H	
1278	CO-O-c-Pr	H	OMe	OH	OMe	H	
1279	CO-O-CH_2CH_2OH	H	OMe	OH	OMe	H	
1280	CO-O-C_8H_{17}	H	OMe	OH	OMe	H	
1281	CO-O-$C_{12}H_{25}$	H	OMe	OH	OMe	H	
1282	CO-O-$C_{16}H_{33}$	H	OMe	OH	OMe	H	
1283	CO-NH_2	H	OMe	OH	OMe	H	
1284	CO-NHMe	H	OMe	OH	OMe	H	
1285	CO-NHEt	H	OMe	OH	OMe	H	
1286	CO-NH-n-Pr	H	OMe	OH	OMe	H	
1287	CO-NH-i-Pr	H	OMe	OH	OMe	H	
1288	CO-NH-c-Pr	H	OMe	OH	OMe	H	
1289	CO-NH-n-Pr	H	OMe	OH	OMe	H	
1290	CO-NH-n-Bu	H	OMe	OH	OMe	H	
1291	CO-NMe_2	H	OMe	OH	OMe	H	
1292	CO-NEt_2	H	OMe	OH	OMe	H	
1293	CO-$NHNH_2$	H	OMe	OH	OMe	H	
1294	CN	H	OMe	OH	OMe	H	
1295	CO-OH	H	OH	OMe	OMe	H	
1296	CO-OMe	H	OH	OMe	OMe	H	
1297	CO-OEt	H	OH	OMe	OMe	H	
1298	CO-O-n-Pr	H	OH	OMe	OMe	H	
1299	CO-O-n-Bu	H	OH	OMe	OMe	H	
1300	CO-O-i-Pen	H	OH	OMe	OMe	H	
1301	CO-O-c-Pr	H	OH	OMe	OMe	H	
1302	CO-O-CH_2CH_2OH	H	OH	OMe	OMe	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1303	CO-O-C_8H_{17}	H	OH	OMe	OMe	H	
1304	CO-O-$C_{12}H_{25}$	H	OH	OMe	OMe	H	
1305	CO-O-$C_{16}H_{33}$	H	OH	OMe	OMe	H	
1306	CO-NH_2	H	OH	OMe	OMe	H	
1307	CO-NHMe	H	OH	OMe	OMe	H	
1308	CO-NHEt	H	OH	OMe	OMe	H	
1309	CO-NH-n-Pr	H	OH	OMe	OMe	H	
1310	CO-NH-i-Pr	H	OH	OMe	OMe	H	
1311	CO-NH-c-Pr	H	OH	OMe	OMe	H	
1312	CO-NH-n-Pr	H	OH	OMe	OMe	H	
1313	CO-NH-n-Bu	H	OH	OMe	OMe	H	
1314	CO-NMe_2	H	OH	OMe	OMe	H	
1315	CO-NEt_2	H	OH	OMe	OMe	H	
1316	CO-$NHNH_2$	H	OH	OMe	OMe	H	
1317	CN	H	OH	OMe	OMe	H	
1318	CO-OH	H	OMe	OAc	OAc	H	
1319	CO-OMe	H	OMe	OAc	OAc	H	
1320	CO-OEt	H	OMe	OAc	OAc	H	
1321	CO-O-n-Pr	H	OMe	OAc	OAc	H	
1322	CO-O-n-Bu	H	OMe	OAc	OAc	H	
1323	CO-O-i-Pen	H	OMe	OAc	OAc	H	
1324	CO-O-c-Pr	H	OMe	OAc	OAc	H	
1325	CO-O-CH_2CH_2OH	H	OMe	OAc	OAc	H	
1326	CO-O-C_8H_{17}	H	OMe	OAc	OAc	H	
1327	CO-O-$C_{12}H_{25}$	H	OMe	OAc	OAc	H	
1328	CO-O-$C_{16}H_{33}$	H	OMe	OAc	OAc	H	
1329	CO-NH_2	H	OMe	OAc	OAc	H	
1330	CO-NHMe	H	OMe	OAc	OAc	H	
1331	CO-NHEt	H	OMe	OAc	OAc	H	
1332	CO-NH-n-Pr	H	OMe	OAc	OAc	H	
1333	CO-NH-i-Pr	H	OMe	OAc	OAc	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1334	CO-NH-c-Pr	H	OMe	OAc	OAc	H	
1335	CO-NH-n-Pr	H	OMe	OAc	OAc	H	
1336	CO-NH-n-Bu	H	OMe	OAc	OAc	H	
1337	$CO-NMe_2$	H	OMe	OAc	OAc	H	
1338	$CO-NEt_2$	H	OMe	OAc	OAc	H	
1339	$CO-NHNH_2$	H	OMe	OAc	OAc	H	
1340	CN	H	OMe	OAc	OAc	H	
1341	CO-OH	H	OMe	OAc	OAc	H	
1342	CO-OMe	H	OMe	OAc	OAc	H	
1343	CO-OEt	H	OMe	OAc	OAc	H	
1344	CO-O-n-Pr	H	OMe	OAc	OAc	H	
1345	CO-O-n-Bu	H	OMe	OAc	OAc	H	
1346	CO-O-i-Pen	H	OMe	OAc	OAc	H	
1347	CO-O-c-Pr	H	OMe	OAc	OAc	H	
1348	$CO-O-CH_2CH_2OH$	H	OMe	OAc	OAc	H	
1349	$CO-O-C_8H_{17}$	H	OMe	OAc	OAc	H	
1350	$CO-O-C_{12}H_{25}$	H	OMe	OAc	OAc	H	
1351	$CO-O-C_{16}H_{33}$	H	OMe	OAc	OAc	H	
1352	$CO-NH_2$	H	OMe	OAc	OAc	H	
1353	CO-NHMe	H	OMe	OAc	OAc	H	
1354	CO-NHEt	H	OMe	OAc	OAc	H	
1355	CO-NH-n-Pr	H	OMe	OAc	OAc	H	
1356	CO-NH-i-Pr	H	OMe	OAc	OAc	H	
1357	CO-NH-c-Pr	H	OMe	OAc	OAc	H	
1358	CO-NH-n-Pr	H	OMe	OAc	OAc	H	
1359	CO-NH-n-Bu	H	OMe	OAc	OAc	H	
1360	$CO-NMe_2$	H	OMe	OAc	OAc	H	
1361	$CO-NEt_2$	H	OMe	OAc	OAc	H	
1362	$CO-NHNH_2$	H	OMe	OAc	OAc	H	
1363	CO-OH	H	OAc	OMe	OH	H	
1364	CO-OMe	H	OAc	OMe	OH	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1365	CO-OEt	H	OAc	OMe	OH	H	
1366	CO-O-n-Pr	H	OAc	OMe	OH	H	
1367	CO-O-n-Bu	H	OAc	OMe	OH	H	
1368	CO-O-i-Pen	H	OAc	OMe	OH	H	
1369	CO-O-c-Pr	H	OAc	OMe	OH	H	
1370	CO-O-CH_2CH_2OH	H	OAc	OMe	OH	H	
1371	CO-O-C_8H_{17}	H	OAc	OMe	OH	H	
1372	CO-O-$C_{12}H_{25}$	H	OAc	OMe	OH	H	
1373	CO-O-$C_{16}H_{33}$	H	OAc	OMe	OH	H	
1374	CO-NH_2	H	OAc	OMe	OH	H	
1375	CO-NHMe	H	OAc	OMe	OH	H	
1376	CO-NHEt	H	OAc	OMe	OH	H	
1377	CO-NH-n-Pr	H	OAc	OMe	OH	H	
1378	CO-NH-i-Pr	H	OAc	OMe	OH	H	
1379	CO-NH-c-Pr	H	OAc	OMe	OH	H	
1380	CO-NH-n-Pr	H	OAc	OMe	OH	H	
1381	CO-NH-n-Bu	H	OAc	OMe	OH	H	
1382	CO-NMe_2	H	OAc	OMe	OH	H	
1383	CO-NEt_2	H	OAc	OMe	OH	H	
1384	CO-$NHNH_2$	H	OAc	OMe	OH	H	
1385	CN	H	OAc	OMe	OH	H	
1386	CO-OH	H	OAc	OMe	OAc	H	
1387	CO-OMe	H	OAc	OMe	OAc	H	
1388	CO-OEt	H	OAc	OMe	OAc	H	
1389	CO-O-n-Pr	H	OAc	OMe	OAc	H	
1390	CO-O-n-Bu	H	OAc	OMe	OAc	H	
1391	CO-O-i-Pen	H	OAc	OMe	OAc	H	
1392	CO-O-c-Pr	H	OAc	OMe	OAc	H	
1393	CO-O-CH_2CH_2OH	H	OAc	OMe	OAc	H	
1394	CO-O-C_8H_{17}	H	OAc	OMe	OAc	H	

Comp. No.	R^1	R^2	$R^3(Z)_n$	$R^4(Z')_m$	$R^5(Z'')_o$	R^6	Physical data
1395	CO-O-$C_{12}H_{25}$	H	OAc	OMe	OAc	H	
1396	CO-O-$C_{16}H_{33}$	H	OAc	OMe	OAc	H	
1397	CO-NH_2	H	OAc	OMe	OAc	H	
1398	CO-NHMe	H	OAc	OMe	OAc	H	
1399	CO-NHEt	H	OAc	OMe	OAc	H	
1400	CO-NH-n-Pr	H	OAc	OMe	OAc	H	
1401	CO-NH-i-Pr	H	OAc	OMe	OAc	H	
1402	CO-NH-c-Pr	H	OAc	OMe	OAc	H	
1403	CO-NH-n-Pr	H	OAc	OMe	OAc	H	
1404	CO-NH-n-Bu	H	OAc	OMe	OAc	H	
1405	CO-NMe_2	H	OAc	OMe	OAc	H	
1406	CO-NEt_2	H	OAc	OMe	OAc	H	
1407	CO-$NHNH_2$	H	OAc	OMe	OAc	H	
1408	CN	H	OAc	OMe	OAc	H	

In table 1:

Comp. = compound
c = cyclo
i = iso
n = normal (straight-chain)
s = secondary
t = tertiary
Ac = acetyl
Bu = n-butyl
n-Bu = n-butyl
Et = ethyl
Me = methyl
n-Pr = n-propyl
i-Pr = isopropyl
c-Pr = cyclopropyl

i-Pen = isopentyl

B) Biological examples

B1) Herbicide and safener in tank mix as spray application

B1.1) Herbicide and safener pre-emergence application by the tank mix method

Seeds of various crop plants and weed species were sown in sandy loam soil in plastic pots of a diameter of 13 cm and covered with a layer of sandy loam of a thickness of about 1 cm. Herbicides and safeners in the form of liquid (for example emulsion concentrates) or dry (for example water-dispersible powders) formulations were diluted with deionized water to the required concentration and applied to the surface of the soil with a spray bar using a water application rate of 300 liters per hectare. In the experiment shown below, the safeners were used as 20 percent strength water-dispersible powders and the herbicide isoxaflutole was used as an aqueous suspension concentrate (see table 1.1.1).
The pots were placed in a greenhouse under favorable growth conditions. Visual scoring of the herbicidal action was carried out four weeks after the herbicide application. Evaluation was carried out on a percentage basis by comparison with untreated control plants (0% = no noticeable effect compared with the untreated plant, 100% = treated plant dies).

Table 1.1.1: Pre-emergence application: herbicide and safener in the tank mix method

Safener	Application rate of safener [g of a.i./ha]	Herbicide H1 pre-emergence application [g of a.i./ha]	% damage in ZEAMA	Safener action as % damage reduction in ZEAMA	Herbicidal action in SETVI (in %)	Herbicidal action in CHEAL (in %)
- -	- -	100	25	- -	96	94
Comp. 1272	250	100	12	52	98	94
Comp. 1050	250	100	3	88	96	97

Abbreviations:

Herbicide H1	=	isoxaflutole
Comp. 1272	=	3,5-dimethoxy-4-hydroxybenzoic acid (cf. tab. 1)
Comp. 1050	=	3,5-dihydroxybenzoic acid (cf. tab. 1)
ZEAMA	=	Zea mays (corn), cv. 'Lorenzo'
SETVI	=	Setaria viridis
CHEAL	=	Chenopodium album

B1.2) Post-emergence application of herbicide and safener by the tank mix method

Seeds of various crop plants and weed species were sown in sandy loam soil in round plastic pots of a diameter of 13 cm and covered with a layer of sandy loam of a thickness of about 1 cm. The pots were placed in a greenhouse under favorable growth conditions for a period of about two to three weeks, allowing the plants to reach a growth stage of 2 to 4 leaves. The herbicides in the form of liquid (for example emulsion concentrates) or dry (for example water-dispersible powders) formulations were mixed with a standard additive (based on rapeseed oil methyl ester), diluted with deionized water to the required concentrations and applied to the green parts of the plants and the uncovered part of the soil surface with a spray bar using a water application rate of 300 liters per hectare. In the experiment shown below, safener and the herbicide foramsulfuron were in each case used as 20 percent strength water-dispersible powder (results see table 1.2.1).

The pots were placed in a greenhouse under favorable growth conditions. Visual scoring of the herbicidal action was carried out four weeks after the herbicide application. Evaluation was carried out on a percentage basis by comparison with untreated control plants (0% = no noticeable effect compared with the untreated plant, 100% = treated plant dies).

Table 1.2.1: Post-emergence application: Herbicide and safener in tank mix method

Safener	Application rate of safener [g of a.i./ha]	Herbicide H2 post-emergence application [g of a.i./ha]	% damage in ZEAMA	Safener action as % damage reduction in crop plants	Herbicidal action as % damage in SETVI	Herbicidal action as % damage in AMARE
- -	- -	40	32	- -	93	90
Comp. 1272	250	40	15	53	95	92
Comp. 1050	250	40	10	69	97	90

Abbreviations:

Herbicide H2 = foramsulfuron
Comp. 1272 = 3,5-dimethoxy-4-hydroxybenzoic acid (cf. tab. 1)
Comp. 1050 = 3,5-dihydroxybenzoic acid (cf. tab. 1)
ZEAMA = Zea mays (corn), cv. 'Lorenzo'
SETVI = Setaria viridis
AMARE = Amaranthus retroflexus

B2) Safener as seed dressing followed by a spray application of herbicide

B2.1) Seed dressing

The number of crop plant seeds required for each application rate of safener was calculated. Sufficient seeds were weighed out into glass bottles having a screw-on lid. The volume of the glass bottles was approximately twice that of the seeds weighed out.

The safeners were formulated as 20 percent strength water-dispersible powders. These formulations were weighed out to give the required application rates (g of

a.i./kg of seed). The samples were added to the seeds in the glass containers, and sufficient water to form a suitable seed dressing was then added. The glass bottles were closed and then mounted in an overhead shaker (which turns the bottles at moderate speed for a period of up to one hour) so that the seeds were uniformly covered with the seed dressing. The bottles were opened and the seeds were ready for use in pre-emergence or post-emergence experiments, as described below.

B2.2) Pre-emergence application of herbicides after seed dressing with safener

The seeds which had been treated with safeners and untreated seeds as controls were sown in sandy loam soil in round plastic pots of a diameter of 13 cm and covered with a layer of sandy loam of a thickness of about 1 cm. The herbicides in the form of liquid (for example emulsion concentrates) or dry (for example water-dispersible powders) formulations were diluted with deionized water to the required concentrations and applied to the surface of the soil with a spray bar using a water application rate of 300 liters per hectare. In the two experiments shown below (results see tables 2.2.1 and 2.2.2), the herbicide isoxaflutole was used as an aqueous suspension concentrate.

The pots were placed in a greenhouse under favorable growth conditions. Visual scoring of the herbicidal action was carried out four weeks after the herbicide application. Evaluation was carried out on a percentage basis by comparison with untreated control plants (0% = no noticeable effect compared with the untreated plant, 100% = treated plant dies).

Table 2.2.1: Herbicide by the pre-emergence method after seed dressing with safener

Safener for seed dressing	Application rate of safener [g of a.i./kg of seed]	Herbicide H1 pre-emergence application [g of a.i./ha]	% damage in ZEAMA	Safener action as % damage reduction in crop plants
- -	- -	100	20	- -
Comp. 1272	1	100	10	50
Comp. 1050	1	100	5	75

Table 2.2.2: Herbicide by the pre-emergence method after seed dressing with safener

Safener for seed dressing	Application rate of safener [g of a.i./kg of seed]	Herbicide H1 pre-emergence application [g of a.i./ha]	% damage in GLXMA	Safener action as % damage reduction in crop plants
- -	- -	100	78	- -
Comp. 1272	1	100	35	55
Comp. 1050	1	100	28	64

Abbreviations in tables 2.2.1 and 2.2.2:

Herbicide H1 = isoxaflutole

Comp. 1272 = 3,5-dimethoxy-4-hydroxybenzoic acid (cf. tab. 1)

Comp. 1050 = 3,5-dihydroxybenzoic acid (cf. tab. 1)

ZEAMA = Zea mays (corn), cv. 'Lorenzo'

GLXMA = Glycine max (soybean), cv. 'Lambert'

B2.3) Post-emergence application of herbicides after seed dressing with safener

The seeds treated with safener and untreated seeds were sown in sandy loam soil in round plastic pots of a diameter of 13 cm and covered with a layer of sandy loam of a thickness of about 1 cm. The pots were placed in a greenhouse under favorable growth conditions for a period of about two to three weeks, allowing the plants to reach a growth stage of 2 to 4 leaves. The herbicides in the form of liquid (for example emulsion concentrates) or dry (for example water-dispersible powders) formulations were mixed with a standard additive (based on rapeseed oil methyl ester), diluted with deionized water to the required concentrations and applied to the green parts of the plants and the uncovered part of the soil surface with a spray bar using a water application rate of 300 liters per hectare. In the experiment shown below, safener and the herbicide foramsulfuron were in each case used as 20 percent strength water-dispersible powder (results see table 2.3.1).

The pots were placed in a greenhouse under favorable growth conditions. Visual scoring of the herbicidal action was carried out four weeks after the herbicide application. Evaluation was carried out on a percentage base by comparison with untreated control plants (0% = no noticeable effect compared with the untreated plant, 100% = treated plant dies).

Table 2.3.1: Post-emergence application of herbicide after seed dressing with safener

Safener for seed dressing	Application rate of safener [g of a.i./kg of seed]	Herbicide H2 post-emergence application [g of a.i./ha]	% damage in ZEAMA	Safener action as % damage reduction in crop plants
- -	- -	40	35	- -
Comp. 1272	1	40	7.5	79
Comp. 1050	1	40	5	86

Abbreviations:

Herbicide H2 = foramsulfuron

Comp. 1272 = 3,5-dimethoxy-4-hydroxybenzoic acid (cf. tab. 1)

Comp. 1050 = 3,5-dihydroxybenzoic acid (cf. tab. 1)

ZEAMA = Zea mays (corn), cv. 'Lorenzo'